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COTTON

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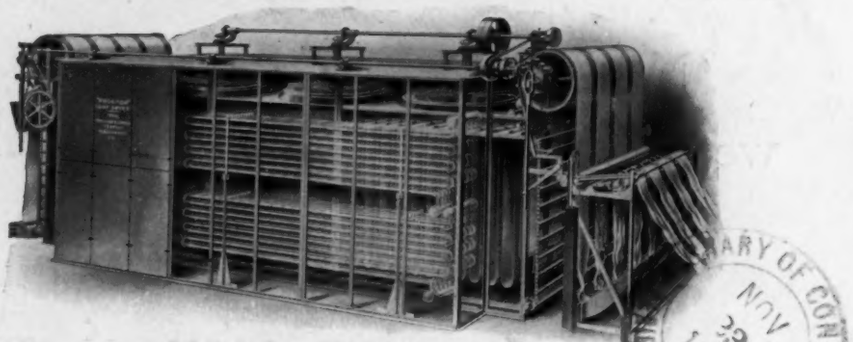

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COTTON

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Volume 82. **Number 11**

THE SOUTH FORCED TO EXPAND.

The War Industries Board advise that the New England states, part of New York, Eastern Pennsylvania, part of Maryland, all of New Jersey and Delaware have become saturated industrially.

Owing to the inability to provide coal, and the congested condition of the railroad shipping facilities the Fuel administration and the Railroad Administration state, "that any new business placed within the district that requires transportation, fuel and power will mean taking the corresponding amount away from work already there.

"Therefore the practice is being followed, viz: before allowing any new business to be placed in the district, a very careful survey is made, and where possible to do so, the work is allocated to some other section of the country."

Truly this means that the cotton textile industry of the South is in line for the biggest and most active period in its history. The dominating field of the cotton manufacturing industry is already in the South. The scene of the greatest activity is already in the South. What is more natural than that the South should be the active manufacturing head of the whole cotton textile industry?

Is it more natural to build and erect cotton mills a thousand miles from the source of supply or right in the midst of the supply? The progress of the last 20 years answers that question. Here are some statistics gathered by a Committee of the National Association of Cotton Manufacturers:

Increase in cotton weaving looms, 15 years ending 1914; North, 19%; South, 162%.

Increase in number of cotton manufacturing establishments, 15 years ending 1914; North, 1%; South, 69%.

Increase in number of employes, 15 years ending 1914; North, 15%; South, 66%.

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Increase in value of products, 15 years ending 1914; North, 73%; South, 199%.

Increase in number of spindles, 20 years ending 1916; north, 39%; South, 311%.

Increase in cotton consumption, 20 years ending 1916; North, 85%; South, 298%.

To this enormous growth in the South is now added the placing of practically all of the northern textile industry within the saturated district and the allocation of Government orders for textiles. The hand-writing is on the wall. Will you put your sales force to work in this favored district?

COTTON, the dominating cotton textile monthly, can help you.

ANOTHER OPPORTUNITY.

The United States Government paid the knitting mills of the United States last year $75,000,000. The unfilled knitting orders are valued at over $200,000,000.

Translated into other words, this is that the knitting mills of the United States are $200,000,000 behind in the delivery of goods to the United States Government. It means that the knitting mills are working to capacity. It means that they are installing equipment as rapidly as it can be purchased and that supplies for knitting mills are in great demand.

It means that manufacturers of supplies and equipment for knitting mills could advertise in COTTON not only to dispose of their goods, but to build good-will amongst the manufacturers of knit goods.

COTTON is a production manager's publication going into many of the knitting plants of the United States.

Scatter optimism broadcast. You can't squander it.

Be time thrifty for your employer, for business and your country, and you can't help being thrifty for yourself.

A Real Protective Paint

is one that successfully withstands for many years the attacks of rust and corrosion.

DIXON'S Silica Graphite Paint

will effectually protect for years, roofs, stacks, fences, etc.

Time tests the efficiency of a paint. We have records of long service given by Dixon's Silica-Graphite Paint in all climates and all kinds of structures.

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Established 1827.

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who builds indiscriminately, without regard to national needs, is guilty of a waste of war power. The man who refrains from extending his plant facilities, when by so doing he could increase his essential service to the nation, is also guilty of a waste of war power.

In spite of adverse conditions obtaining in the construction field, our organization continues to meet for its clients a demand for economical, speedily built, wholly satisfactory industrial structures.

G. W. Feaga

GARLAND

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Have the loops filled with varnish so that the eyes cannot break back or work loose. They are as solid as the best varnish can make them and remain in this condition until the harness is worn out.

G TRADE MARK

GARLAND MFG. CO.

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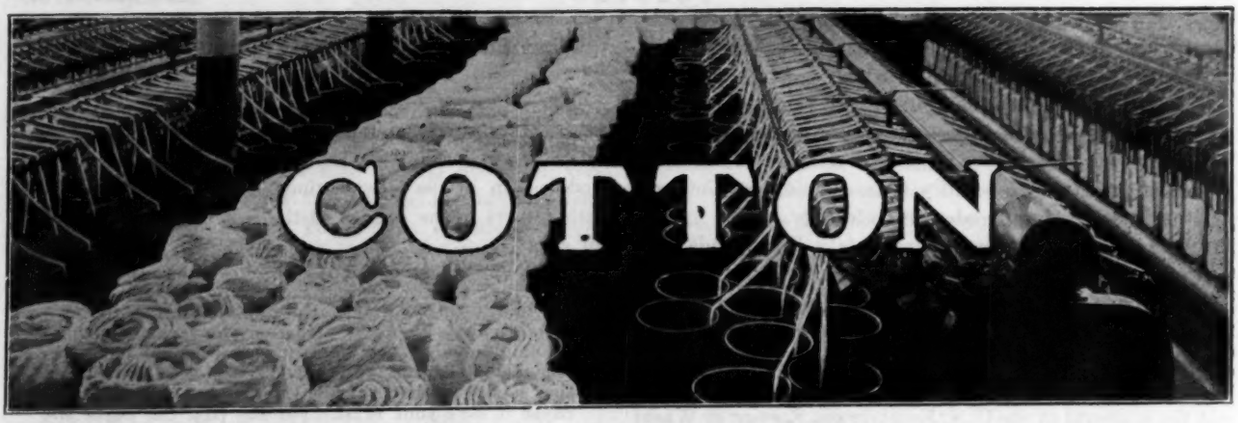

September, Nineteen-Eighteen

Conserving Cotton Mill Labor.

The unprecedented demands—both military and industrial—upon our country's man power, are fast fulfilling propheeies made at our entry into the war, that when we finally took our place with our allies on a gigantic war basis, women would fill the places of men in our great industrial plants. But there are thousands of jobs for which women are unfitted. Where shall we get men for these jobs? This was the paramount question discussed at the national war labor conference which convened in Washington last June.

It was a subject reviewed by many speakers and the almost universal decision was the need of a National Employment Service to be conducted by the department of labor which would bring to an end the continuous conflict among employers and prevent the more or less wholesale labor "stealing" and "poaching" that has been largely responsible for the disorganization of the labor supply.

It was shown by one of the speakers who had gone into the statistics of the labor question, that labor turnover is one of the primary handicaps to maximum war production. He declared that the then normal labor turnover amounted to twenty per cent. Seven-tenths of the cities covered by a survey for the week of June 15th reported a shortage of common labor. There was also a shortage of skilled labor in many industries.

Cotton manufacturers have appreciated these conditions fully as is shown by a perusal of the reports of all their current year conventions. In many instances innovations of some character have been adopted looking to the improvement of these conditions, but very few plants have a complete personnel.

In approving the suggestion for a National Employment Service, President Wilson said:

> "There has been much confusion as to essential products. There has been ignorance of conditions—men have gone hundreds of miles in search of a job and wages which they might have found at their doors. Employers holding government contracts of the highest importance have competed for workers with holders of similar contracts, and even with the Government itself, and have conducted expensive campaigns for recruiting labor in sections where the supply of labor was already exhausted. California draws its unskilled labor from as far east as Buffalo, and New York from as far west as the Mississippi. Thus, labor has been induced to move fruitlessly from one place to another, congesting the railways and losing both time and money.
>
> "Such a condition is unfair alike to employer and employe, but most of all to the nation itself, whose existence is threatened by any decrease in its productive power . It is obvious that this situation can be clarified and equalized by a central agency—the United States Employment Service of the Deparment of Labor, with the counsel of the War Labor Policies Board as the voice of all the industrial agencies of the Government. Such a central agency must have sole direction of all recruiting of civilian workers in war work and, in taking over this great responsibility, must at the same time have power to assure to essential industry an adequate supply of labor, even to the extent of withdrawing workers from non-essential production. It must also protect labor from insincere and thoughtless appeals made to it under the plea of patriotism, and assure it that, when it is asked to volunteer in some priority industry, the need is real.
>
> "Therefore, I, Woodrow Wilson, President of the United States of America, solemnly urge all employers engaged in war work to refrain after August 1, 1918, from recruiting unskilled labor in any manner except through this central agency. I urge labor to respond as loyally as heretofore to any calls issued by this agency for voluntary enlistment in esssential industry. And I ask them both alike to remember that no sacrifice will have been in vain, if we are able to prove beyond all question that the highest and best form of efficiency is the spontaneous co-operation of a free people."

Since August first this National Employment Service has undertaken to be the medium through which the employers of the United States might obtain their unskilled labor. At its local or district offices employers may confidently expect to learn of all the workers available for the positions they wish to fill, while the worker, with equal confidence, may expect to learn of the opportunities for employment which are open to him.

For success these labor exchanges obviously must be managed in such a manner, and under such auspices, as to assure their entire impartiality and their operation solely as agencies for coordinating supply and demand for labor, with elimination of all possible waste. Assurance of this kind, both for employers and for workers, is usually sought through supervision by a committee composed equally of representatives of employers and of workers.

The plan of the United States Employment Service contemplates the use of such committees to be called advisory councils. In each of the thirteen districts into which the country is divided by the Employment Service there are to be advisory councils. They will consider questions of policy important to their districts and advise the directors of the employment service who are in charge of the districts. Larger questions of policy will be referred to Wash-

ington, for decision by the central War Labor Policies Board.

In each community there is a local community labor board, consisting of a representative of the Employment Service, a representative of employers and a representative of the employed. This board will have jurisdiction over recruiting and distributing labor in its locality.

A survey of the labor requirements is being made, and in order that each community may be fully protected, rulings have been issued that no labor shall be transported out of any community by the U. S. Employment Service without the approval of the State Director; nor shall any labor be removed by the Service from one state to another without the approval of the U. S. Employment Service at Washington. Every effort will be made to discourage any movements from community to community or state to state by any other service.

The requirement that unskilled labor must be recruited through the sole agency of the U. S. Employment Service does not at present apply in the following five cases:

1. Labor which is not directly or indirectly solicited.
2. Labor for the railroads.
3. Farm labor—to be recruited in accordance with existing arrangement with Department of Agriculture.
4. Labor for non-war work.
5. Labor for establishments whose maximum force does not exceed one hundred.

When the survey of labor requirements has been made and the aggregate demand for unskilled labor in war work is found, each state will be assigned a quota, representing the common labor to be drawn from among men engaged in non-essential industries in that state.

These state quotas will in turn be distributed among localities. Within each locality, employers in non-war work, including those who are only partially in war work, will be asked to distribute the local quotas from time to time amongst themselves. Quotas by localities and individuals are to be accepted as readily as they are for Liberty Loan and Red Cross campaigns. This plan of labor quotas is a protection for all communities. The object is to keep any community from being drained of labor, and to use local supply, as far as possible, for local demand.

From the foregoing outline it will be noted that this is probably the most drastic action that the government has taken since putting the National Army draft into effect. The absolute necessity for this program can be seen when it is realized that in Pittsburgh, for instance, there are advertisements calling for men to go to Detroit; while in Detroit street cars there are posters asking men to go to Pittsburgh. This same condition is apparent all over the United States and in the consequent shifting of labor a great part of our war effort is dissipated.

This same condition is to be found in many individual industries today, including that of cotton manufacturing, and it would seem a step of wisdom on the part of all these manufacturers to urge patriotic cooperation among themselves for the conservation of all kinds of labor, whether or not included in the National Employment Service. This might even go so far as to delete all advertising for operatives outside of the state in which the plant is located and devote the energy so expended to propagate interest among unemployed classes in their own and nearby communities.

What Shall Be Done With Low Grade Cotton?

The editor of Cotton and Cotton Oil News, a journal for planters which is published in Texas, is urging his readers to begin a campaign on their congressmen to secure a modification in the specifications of Government contracts with respect to the quality of the raw materials. This editor says:

> "You are bound to have this low grade cotton. It isn't your fault. You can't control the elements. If you had it within your control, as a manufacturer, for instance, has, to decide whether your cotton should be a low grade or a high grade, it would be a different matter, but you haven't. Nobody has. And that is just exactly why it should have a market, because it isn't your fault. For the past ten years you have produced an average of 1,000,000 bales a year of it, and the prospects are that you will produce even a greater amount this year."

While COTTON has not the slightest objection to any quality changes the Federal Administration may be induced to make it contract specifications, it seems to us as if the increasing production of low grades is a question for careful study and investigation. Would not our contemporary be doing a more constructive work if it would urge more careful seed selection and an improvement in quality production?

On another page of this number is a letter from a manufacturer correspondent who has also been a planter, and it may be that some of his suggesstions will start the tide of thought in the direction of better quality. Also, in cotton growing, better quality staple usually means a larger production per acre, another subject for the thoughtful consideration of the cotton grower.

When the time comes for the planter to realize the real value of quality staple, he will not only give greater heed to his growing methods, but he will insist that this valuable product be suitably baled and covered to prevent the immense loss and damage so prevalent today.

A New Organization of Knitters.

A new western knitter's association was organized at a meeting held in the Sherman Hotel, Chicago, on August 8th. This was called the War Service Association of Outer Knitted Apparel Manufacturers. The principal purpose of the association is to co-operate with the War Industries Board in the conservation of material and labor, and to thereby render aid in winning the war.

Resolutions were passed modifying and restricting the styles and colors of various kinds of knitted outer apparel and regulating the mixture of raw material used, as well as certain modifications in the trimming.

Two sessions were held, with a luncheon between. Following are the list of officers of the new association: President, A. J. Friedlander, of M. Friedlander Knitting Co., Milwaukee; Vice-President, L. S. Wilcox, Oneida Knitting Co., Defere, Wis.; Secretary and Treasurer, David F. Shogren, Midland Knitting Mills, Chicago. Directors: H. S. Whiting, Olympia, Wash.; O. A. Finck, Milwaukee; David Karger, Milwaukee; A. S. Farnum, La Crosse, Wis.; Herman Newberger, Chicago; F. L. Shippee, Kenosha, Wis.; R. S. Welsch, Chicago; C. Jamar, Duluth, Minn., and F. C. Hogle, Bay City, Mich.

A Work of Art.

"A Tale of Five Cities" is the title of a handsome book illustrating and describing a group of mills located in Chambers County, Ala., but with general offices in West Point, Ga., whose products are sold by Wellington, Sears & Co., of Boston, Mass. These mills include the West Point Mfg. Co., operating the Langdale Mills, the Shawmut Mill, the Fairfax Mill and the West Point Utilization Co., also the Lanett Cotton Mills; the Riverdale Cotton Mills; and the Lanett Bleachery and Dye Works. All these mills are located on the line of the Chattahoochee Valley Railway, the most distant being nine miles from the general offices at West Point. Altogether these mills employ 4,000 people, consume 100,000 bales of cotton annually and an average payroll is around $50,000 a week.

The cover of this book which is in light green chamois finish boards, presents as an inset in four colors an heroic figure of Industry with her distaff, while at her feet lie the Chattahoochee river and the five cities from which the book takes its name. Printed on high quality enamel paper stock, the two, three, and quadri-color processes have been lavishly used for both illustrative and decorative purposes.

Many pages of illustrations in photo brown show views of the various mill interiors; educational, social and religious welfare activitites; the homes of the operatives and their environment, etc., while the statistical and explanatory pages are handsomely embellished with illustrations in subdued duo-tone effects.

The inside of the front cover discloses two pages in five-color combination depicting the transferance of the cotton from the field to the factory. The inside back cover shows two pages in similar color effects symbolical of some of the uses to which a few of their textile products are put. Another special feature of the volume is a four-page, three-color group picture of the six mills. In this book the arts of printing, engraving and paper making have been skillfully blended to produce an exceptionally high grade result.

The purpose of the book is to familiarize those financially and otherwise interested with some of the more important facts concerning the industries therein represented, and to afford an insight into the living conditions and environment surrounding the employees of these enterprises. These industries are under the general direction of General Manager George H. Lanier, of West Point.

Warehouses In The North.

Plans are under way to establish a chain of warehouses at New York and in the New England states to provide capacity for about 3,000,000 bales of cotton. This project is being favored by the National Association of Cotton Manufacturers, Rufus R. Wilson, the secretary, taking an active interest in the proposed work. Under the auspices of the association meetings have been held to formulate definite plans for immediate action, with intention to establish different warehouses as follows:

New York, capacity 1,000,000 bales; Boston, capacity 1,000,000 bales; Providence, capacity 500,000 bales; New Bedford, Mass., 250,000 bales; and Fall River, 250,000 bales. In the erection of these structures it is planned to make a thorough study of the different warehousing systems of the South, duplicating where deemed advisable to provide for greatest efficiency in the various units. Unquestionably, these new warehouses will embody every improved feature of modern construction.

It is pointed out that the establishment of a series of warehouses in the Northeastern section of the country will tend to abolish the uncertainty now evidenced in utilizing cotton in transit, and of indefinite location from time to time, as collateral with the banks. Under this plan, the banker would be assured of first-class security in the cotton held in bonded warehouses. Moreover, the United States Warehouse Act as well as the Bill of Lading Act would make a project of this nature thoroughly feasible at the present time.

The fundamental idea of the proposed plan is to act as a substitute for the proposition recently advanced for the Government to form a United States Cotton Corporation. It is understood that the War Finance Corporation views the construction of cotton warehouses in this part of the country as a move in the right direction, maintaining that it would prove a valuable means in facilitating the financing of the coming cotton crop.

The Careful Packing of Yarn Shipments.

The following letter from E. J. McCaughey, vice-president and manager of the Home Bleach and Dye Works, Pawtucket, R. I., directs the attention of managers of Southern mills to the serious losses incurred through the careless packing of yarns for shipment.

EDITOR COTTON:

"We would be pleased to state in your esteemed publication that we are having a great deal of trouble with the cotton warps and skeins coming from Southern mills, owing to the flimsy tie bands on the skeins and imperfect covering on the ball warps.

"We would say, in reference to the ball warps, that we have been doing missionary work for the past ten years, advising the yarn dealers that the warps were being sent from the mills with scanty covering, allowing the sharp edges of the wooden shells to chafe the yarn on the rolls while in transit to points in the North. We have recommended paper cardboard discs for the ends of the ball warps and a piece of burlap to be wound tightly over the whole package, including the ends of the wooden shells. Some of the mills have been shipping this way and it makes a great difference when we come to mercerize, dye, bleach and wind these warps, as when breaks occur there is a lot of labor wasted in trying to wind the yarn on a quilling frame or to beam it when it is used for warp purposes.

"As to the skeins, would say that we have some cases of carded peeler 54-inch skeins being banded with a single thread of 40/2 yarn and this is not sufficiently strong to stand the process of mercerizing, dyeing, bleaching and winding, which our customers specify when they send us this yarn.

"We have complained to the Yarn Dealers, but they advise us that they are fortunate to be able to find any kind

of yarn at this time and they request us to do the best we can, which means nothing, as when the yarn is placed on our spooling frames the winders find it impossible to manipulate the skeins. Besides, there is a great expense caused the dyer and winder which does not belong to him, but should be charged to the cotton mill in which this careless work is allowed to pass.

"The writer thinks that by appealing to the mills through your paper, it will be necessary only to bring this matter to the attention of the owners, or the managers, in order to have the proper remedy applied.

"In our opinion this is a good place to practice the efficiency which is being advocated so strongly during these war times."

The Problem of Fuel Storage.

Because of the intense difficulties in the securing of fuel which prevailed last winter and the looked for continued shortage during the coming winter, many mills have made or are making preparation for storing as much fuel as may be available on and about the mill premises, not only for the operation of the plant itself, but also for the home consumption of their many operatives. This increased tendency to store fuel, both soft coal and wood, makes timely a few suggestions on the proper storage of these materials to prevent, in so far as it may be possible, more or less disastrous fires which might result from improper handling of the stored material.

It is, of course, well known that soft coal should preferrably be stored in pockets or bins of concrete or other incombustible material, suitably roofed over to keep out rain and snow. The space between the roof and the top of the pile of coal should also be properly ventilated to avoid any danger from explosion of gases.

Spontaneous combustion is, perhaps, more to be feared from recently mined coal than that which has been out of the mine for some time. Certain precautions, however, are necessary to avoid the danger of spontaneous combustion in all soft coal storage.

It is well to note that coal should not be piled against, or so as to seriously expose any mill building in case of a fire in the coal pile. Furthermore, it should never be piled close to a frame building. Care should be taken not to store it near external sources of heat even though the heat from such sources may be moderate. It is also advisable not to have more than 500 tons of coal in any one pile and at least 25 feet of clear space maintained between such piles.

Whether piled in the open or under cover, coal should not be packed to more than 10 or 12 feet deep and not over 20 feet wide, approximately, so that no part of the pile would be more than 10 feet from any air cooled surface. If possible, it is always best to avoid alternate wetting and drying and if some coal is received wet, it should be put around the edges of a pile where air can get to it freely and where other coal will not be placed over it.

In unloading the cars it is better to mix the lump and fine coal as much as possible in order to avoid the formation of air passages which might facilitate the spread of a fire in the coal pile. It is also advisable to avoid the admission of air to the interior of the coal pile through interstices around piers or timbers.

Vent pipes, about 1 inch in diameter, should be located vertically in these piles, one to each three or four hundred square feet of area, with the lower end of these pipes varying distances from the bottom of the pile. By so arranging the coal pile a thermometer may be lowered into these pipes at weekly intervals to ascertain the temperature existing inside the pile of coal.

In the case of those mills that supply the mill village with stove wood, or the very few mills that use wood entirely as a fuel, a few suggestions on cord wood storage is apropos.

In the first place, the site on which the wood is to be piled and for some distance around this site the ground should be thoroughly cleared of all vegetable and other matter. The ground around the pile of wood and in the aisles between such piles should be kept thoroughly cleaned.

In planning the location of such wood piles, their relation to nearby hydrants should be considered and the piles and aisles should be so arranged as to facilitate the handling of hose streams. It it always better to maintain a clear space of at least 50 feet or as much more as possible, between such wood piles and the mill buildings or warehouses.

The wood should always be neatly stacked so as to avoid leaving large air spaces between the sticks which would facilitate the spread of a fire if it once started. A suitable wood pile should not be over 16 feet in height, 8 feet wide and 100 feet long. Aisles not less than 15 feet wide should be provided between adjacent piles.

In mill yards where it is the usual annual custom to locate large piles of cord wood, a monitor nozzle centrally located on an elevated platform and commanding all sections of these wood piles is an immense factor of safety and most desirable. Such a nozzle could be supplied by a three inch pipe which might be normally kept dry, and with a valve at the yard main or at the pump which could be opened in case of fire.

Of course regular watchman service could always be provided and all loitering and smoking strictly prohibited.

With proper care and attention to these common sense details of storage, the coming winter should see little loss or damage as a result of the great fuel shortage preparations now going on at any many manufacturing plants.

Aniline Dyes and Chemicals, Inc., is the name of the new firm that has acquired the property and assets formerly belonging to the firm of Geisenheimer & Co., of New York, the dissolution being brought about by the retirement of Theodore Geisenheimer. Alfred F. Lichtenstein of the old firm will continue as president and treasurer of the new corporation. Other officers are: first vice-president, W. H. Van Winckel, formerly sales manager of The Dow Chemical Co., of Midland, Michigan; second vice-president, Robert Hilton, vice-president of The Ault & Wiborg Co., of Cincinnati, Ohio; and secretary, Henry A. Datter.

This corporation will continue the business of the old firm, and by materially increasing its staff, do justice to the products manufactured by the organization for which they are the sole selling agents, namely, The Ault & Wiborg Co., of Cincinnati, Ohio.

ILLUMINATING THE MODERN MILL

By A. L. POWELL *

FIG. 3. THE WAY "PINK" HAMRICK DOES IT.

Night view in the Roving and Spinning Departments in a South Carolina mill. General illumination is used. 500 watt Mazda C lamps in enameled dome shaped reflectors are hung 18 feet high, spaced 24 x 35 feet. The distribution is such that excellent light is had on vertical surfaces. The whole room is uniformly illuminated, cheerful and safe.

The Effect of Good Illumination on Surroundings and Morale.

In a previous article it was pointed out that proper artificial illumination increased production which, of course, means definite economic gains. The relation between light and safety was also shown. There are certain other beneficial results, the nature of which are indicated in the subheading.

If a mill is well lighted throughout, it will be tidy, for litter and refuse will not be permitted to accumulate, if it is clearly visible to the superintendent. Waste material always tends to accumulate in dark corners. Shop sanitation is an important element. A well lighted shop is pleasant to work in. It attracts and holds employees. In view of the possibilities of even greater labor shortages, this feature is of much importance, for contented employees certainly constitute an essential asset. Cases are on record where one mill in a section has been markedly better illuminated and has actually, through this means, obtained the very pick of the hands in the surrounding country.

The importance of making workplaces congenial, is never fully realized until an analysis of the question is made. Surely no one would cut off the heat in winter to decrease operating expenses, yet many uninformed mill operators try to skimp and save on the lighting. Without the heat everyone knows the fingers would be numb and slow of action. Without proper lighting the senses may become dulled. Everyone knows how depressed he is in the semi-darkness of a cloudy day or in the twilight. When the spirit is depressed one cannot do the best work.

Any plant manager knows that the experienced or trained man is an asset not easily replaced. If this man has been working continuously under insufficient illumination, its detrimental effect will eventually show up in his failing eyesight. He becomes incapacitated at the very time when he should be yielding the biggest return on the investment made in training.

Shop illumination has an effect on the firm's reputation. This may seem like an extravagant statement, but it applies in this manner. Under poor lighting it is difficult to detect defective goods and they may get by the inspector, eventually reaching the market causing loss of business and prestige. This condition is especially important in the textile mill, operating on a piece work schedule. The operative, through eagerness to increase his income, will take advan-

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FIG. 1. TYPICAL DIRECT LIGHTING REFLECTORS FOR TEXTILE MILLS. A—ENAMELED STEEL DEEP BOWL SHAPE. B—ENAMELED STEEL DOME SHAPE. C—PRISMATIC DEEP BOWL (CRYSTAL GLASS). D—DENSE OPAL DEEP BOWL.

tage of the poor light to cover up poor work. Even if such goods are detected before shipment, it is necessary to put them on the market as second class, thus entailing a certain amount of loss. A second grade product is at best a very unsatisfactory output, and should be reduced to a minimum. Possibly good illumination will not entirely eliminate these faults, but by reducing the possibility of such faults it will effect a very considerable economy in the production.

Incandescent Lamps.

The incandescent lamp is inherently an almost ideal illuminant for it can be effectively adapted to all classes of lighting. There are no moving parts to get out of order and skilled attendance is not necessary. All types at present on the market operate equally well on A. C. and D. C., and on all frequencies with unity power factor. The light produced is steady and is not seriously affected by voltage fluctuations. There is a wide range of sizes available, such as found in no other illuminant, so that exactly the correct amount of light can be produced for all ordinary conditions. All lamps are standardized as well as sockets, holders, reflectors and other accessories. This feature is a great convenience to purchasing agents, enabling them to keep a minimum supply of pieces of apparatus. The leading manufacturers maintain stocks of lamps at convenient points all over the country so that there is, in general, little delay in shipment.

The initial investment for incandescent lamp installations is very low in comparison with other illuminants and from this very feature, advantage can be taken of future improvements without the loss incidental to the scrapping of expensive equipment which has become obsolete.

There is a minimum fire risk with incandescent lamps which is particularly important where dust and flying particles are of such a character that a spark might cause an explosion. The incandescent lamps are designed to give a relatively long life and are durable enough for all ordinary uses. They emit a pleasing color of light.

FIG. 2. NIGHT DOESN'T AFFECT THIS PICKER ROOM.

An installation of deep bowl porcelain enameled steel reflectors and 100 watt Mazda lamps hung 12 feet high, spaced 12 x 22 feet in the Picker Room of a Southern cotton mill. The white side walls and ceilings give excellent diffusion to the light and prevent the room appearing gloomy. This condition sometimes prevails when deep bowl reflectors are used in rooms with dark surroundings.

It is self-evident that the most efficient type of incandescent lamp is the one to be used, and the Mazda lamp fulfills this condition. There is no excuse for the continued use of the very inefficient carbon lamps.

There are three principal types of Mazda lamps, known as Mazda B, Mazda C, and Mazda C-2. The filament of all these lamps is of drawn tungsten wire.

The filament in the Mazda B lamp is wound on flexible anchors in a loop form and the clear glass bulb carefully evacuated, hence these are often referred to as vacuum lamps. This construction is used on all the smaller sizes (from 10 to 100 watts). Such lamps are used for local lighting or for general illumination, when only a very low intensity is required.

In the Mazda C lamp, the filament is coiled to resemble a very fine spring and this is supported by a set of anchors. The bulb is evacuated and then an inert gas, or mixture of these gases, is introduced in the bulb. This form of construction has caused such Mazda lamps to be occasionally referred to as "gas filled," or "non-vacuum" lamps. The action of the gas in the bulb is to retard the evaporation of the filament and permit a higher operating temperature. The higher the temperature of the lamp filament, the greater the amount of light produced for a given power consumption. The gas has a secondary action, that of cooling the filament, which tends to offset its qualities. This action makes it uneconomical to use such a construction in lamps of low wattage. Mazda C lamps are made in sizes from 75 to 1000 watts and are especially well adapted for localized general or general illumination.

The Mazda C-2 lamp is the latest development in incandescent lamps. It has a construction similar to the Mazda C but it is provided with a special blue glass bulb. This bulb causes the emitted light to be approximately daylight in color quality. This feature of artificial illumination will be discussed more in detail in an article on color inspection with artificial light.

While Mazda lamps are made for 110-125 and 220-250 volt circuits, it is advisable, in planning the wiring for lighting to provide 110 volt circuits. Lamps of the 110 volt type are somewhat more efficient than those of the higher voltages and of much more uniform quality, as well as lower cost. Although Mazda lamps are not seriously affected by ordinary voltage fluctuations, it is very desirable to separate lighting circuits from power circuits as the variation in intensity is annoying to persons working in the room.

In order to insure obtaining promptly incandescent lamps of the type desired, it is well to specify the following points when ordering lamps: Quantity, type, wattage, voltage, bulb (shape), base and whether clear or frosted.

FIG. 4. A DAYLIGHT PICTURE OF THIS ROOM WAS PUBLISHED IN COTTON FOR JUNE.

The new weave shed of the Lanett (Ala.) Cotton Mills as it appears under artificial illumination. 200 watt Mazda C lamps in reflecto cap units are hung 15 feet high, spaced 21 x 14 feet. This reflecting device is designed to give excellent diffusion and minimize glare. It is of interest to note the absence of overhead obstructions and the general neatness of the entire shed.

The frosting of incandescent lamps is all too frequently neglected. In using the Mazda C lamp, particularly when the filament is in the line of vision, it is recommended that the lamps be bowl frosted. Most persons have an idea that frosting absorbs a great deal of light. Actual measurements show this to be quite incorrect. The decrease in mean spherical candle power or total light output with bowl frosting is less than 5 per cent, with the lamp completely frosted, about 8 per cent. The gain in ability to see far more than offsets this loss.

Reflectors.

Good illumination means not only sufficient intensity, but also the proper distribution and diffusion. Light may be produced by lamps without reflectors, it is true, but this would be wasteful of power and cause ineffective lighting due to glare.

The incandescent lamp is designed to be a renewable part and distribute light equally in all directions to meet

universal requirements. A reflector redirects light and can be selected to meet particular demands. It directs the light in the useful angles. A reflector also protects the eyes of the workers. Glare of unshielded light sources is a thing to be distinctly avoided.

There are two principal groups of reflectors, metal and glass. Glass reflectors are opalescent, prismatic or mirrored. The opalescent and prismatic glass reflectors are not very extensively used in textile mills. Dust and dirt collects on any lighting equipment and with translucent reflectors, is much more noticeable. Such reflectors, however, are often quite desirable on account of the light emitted upward, which makes the room appear quite cheerful.

If a good cleaning system is maintained, there should be no reason why such reflectors should not receive much wider use. In fact, some mill superintendents prefer translucent glass reflectors for the following reasons. Cleaners in sweeping down are very likely to strike metal reflectors heavy blows and break the lamp. The opalescent glass reflector appears more fragile and the workman is not so likely to hit it a heavy blow. Dense opal direct lighting reflectors are very efficient and low in first cost. The prismatic and mirrored glass reflectors also give high light output although of somewhat higher first cost.

Steel reflectors are generally recognized as a standard industrial equipment. They are made in two finishes, white porcelain enamel and mat aluminum. In most industries porcelain enamel is far more widely used and justly so. It presents a surface which is virtually glass. It can be easily cleaned and its lustre is not destroyed by scrubbing. It is not affected by moisture or acid fumes. After cleaning it returns to practically initial efficiency. The aluminum finished reflector is widely used in cotton mills, but the writer has noticed many installations in which the reflecting surface has practically peeled off or become so dirty that it is useless. The high humidity has a deteriorating effect on the aluminum finish. The greater first cost of porcelain enamel is well justified in view of its durability.

Metal reflectors are made in three general types, deep bowl, dome shaped and angle. The deep bowl gives a lower cut-off. In other words, the lamp is not visible at as great an angle as when used in the dome reflector. This, however, tends to reduce the amount of light on vertical sections and although it may be excellently lighted on the working plane, a room frequently appears very dull and cheerless when bowl reflectors are used. The dome type reflector distributes the light thru a considerable wider angle and if properly designed has a sufficient cut-off to shield the eyes. It is considerably more efficient than the deep bowl type. When bowl frosted lamps are used in the dome reflector up to and including the 100 watt Mazda C, excellent results are obtained, the rooms appear bright and pleasant and vertical surfaces are well illuminated.

An angle reflector, as its name implies, is of the deep bowl shape with a holder set at an angle to the axis. Such equipment is useful where especially high illumination is required on vertical surfaces.

There are a number of styles of specially designed equipment for industrial lighting. A typical one is known as the reflecto cap unit. A polished metal cap is held under the lower half of the lamp bulb to cut off the direct light of the lamp. The reflector itself is relatively large and these two features give excellent diffusion, eliminating sharp shadows and annoying reflections. This special combination reduces the total output of light slightly and necessitates a slightly higher cost of equipment. But where a specially well diffused illumination is desired, such a unit proves very useful. Other diffusing units consist of opalescent enclosing globes about the lamp with white relatively flat reflectors placed above; if these are well designed they prove very useful.

Maintenance of Installation.

To obtain the most satisfactory results from an incandescent lamp installation certain precautions must be taken. These are in brief as follows:

Mazda lamps are designed to operate most economically under all ordinary conditions at the voltage indicated on the label. This rating takes into account renewal and energy costs. If the circuit voltage is appreciably higher than the labeled voltage, short life of lamps will result. If the voltage at the socket is considerably lower than indicated on the label of the lamp in use, it will not emit the proper quantity of light. To make up for this loss of illumination it is necessary to install additional lamps. For instance, seven Mazda lamps operating at rated efficiency will give the equivalent amount of light of eight Mazda lamps operating 4 volts below the rated efficiency of the lamps.

Before ordering lamps, it is desirable to determine what average voltage is actually attained at the socket. Where the voltage of the system fluctuates during the day or where it varies in different parts of the installation, it is proper to order lamps as near the average of this variation as possible.

Lamp manufacturers estimate the average life to be expected from their product when operated under certain conditions. This average is estimated from data gained from a great number of tests. There will, however, be an occasional early burn-out, but, on the other hand, this is compensated for by a longer life of another lamp. So, when taking the installation as a whole, the estimated average life may be considered as reliable. For the most satisfactory plant operation, burned out lamps should be replaced at once and those which have burned far beyond their normal lives and become badly discolored or blackened, should be discarded.

The efficiency of any system of illumination is dependent in a large degree upon cleanliness. A large percentage of the light will be absorbed and wasted in the transmitting and reflecting surfaces if they are allowed to accumulate dust, grime and oil. Some forms of lighting units are far less susceptible than others. For example, the inverted bowls of indirect systems are most affected. Instances have been noted where semi-indirect units have been allowed to go uncleaned for six months. Illumination readings were taken before and after cleaning the units. The results showed an increase of from 30 to 40 per cent due to cleaning. A great deal of this depreciation occurred in the first few weeks, so that for a period of about four months or so the work tables had only been receiving about 60 per cent of the light which was intended to reach them and which they could have had for no extra cost if a little attention had been paid to cleanliness. This point applies equally well to totally indirect units and shows forcibly the necessity of careful maintenance. With direct lighting the question of cleaning is also of much importance, for while the

depreciation is not as rapid it is certainly present. As an example, an opaque steel reflector which is the least susceptible to the collection of dirt and dust of any depreciated over 10 per cent in light output in a twelve-week period, while a light density opal glass direct lighting reflector depreciated nearly twenty-five per cent in the same period.

Haphazard cleaning has not usually been found satisfactory, since the accumulation is so gradual that it is not readily noticeable by those responsible. Much better success has been secured by organized cleaning at stated intervals under the charge of a maintenance department.

Usually both the lamp and reflectors or diffusing device accumulate foreign material. The deposit on the outside of the lamp is easily removed. The lamp, if covered with dry dirt, as is usually the case in textile mills, can be wiped clean with a dry cloth. The Mazda lamp is many times stronger than the old pressed filament lamp, yet it is not "fool proof"; accordingly, reasonable care should be used in handling the lamp after it has been burning for some length of time. There is always less danger of breakage if the lamp be left burning while it is being cleaned. The use of feather dusters should be avoided. If dry dirt accumulates on a smooth reflector a dust cloth will remove most of it, but at the fifth or sixth cleaning water and some cleaner should be used. Dry dirt on the prismatic reflector can be removed by a stiff dry bristle brush with an occasional washing. Dry dirt on a rough reflector is not so easily removed as it lodges in a multitude of small holes. A wet treatment must be used in this case at each cleaning.

Greasy or wet accumulations in all three classes of reflectors must be removed by washing. Soap and water are good agents for the smooth surface reflectors, but care must be taken to remove the film of soap by rinsing thoroughly. Dried soap accumulates dust very rapidly. The rough reflectors may best be cleaned by some of the patent preparations now on the market. These cleaners should be so smooth as not to make microscopic scratches on the glass and should not leave a film. They may be applied with a piece of cotton waste or soft cloth, and polished off with dry waste or cloth. A bristle brush is often useful. It is also alvisable in some cases to rinse with water to remove the cleaner from the crevices.

Where lamps are hung high and it is necessary to use a ladder to reach them, it is advisable to have on hand an extra globe or reflector, which may be put in place of the dirty globe and the latter carried to the cleaning place, which, after washing, could be substituted for the next one and so on. This necessitates only one trip up the ladder.

(This is the second of a series of articles on Cotton Mill Illumination which Mr. Powell is preparing for COTTON. The first article was published in the August number. Further informative articles will follow.)

FIG. 5. A DIFFICULT LIGHTING PROBLEM.

To properly light these tape looms with the high racks which cast shadows, is somewhat of a problem. Mazda C lamps in semi-indirect fixtures have been used here successfully. The ceiling is light in color and reflects the light well. All parts of the machines stand out clearly in this night photograph.

Coal Is King.

National stress emphasizes more than ever before the necessity of conserving coal. It must not be wasted. You would not think of deliberately throwing away shovelfuls of coal, but that is what really happens when heating surfaces are so fouled that a large portion of the heat goes up the stack. Boiler scale is a poor conductor of heat, and prevents a free interchange of heat, just as do the pipe coverings on steam lines. Its presence can oftimes cause a fuel waste of 20 per cent or more. Dixon's boiler graphite, properly used, will, it is claimed, keep boilers free from scale and put the cost of the wasted coal back into the treasury. The principle of its action and other interesting data are contained in a booklet No. 34T.

A System of Laboratory Management

BY FREDERIC DANNERTH, Ph. D.

The Valuation of Dyes.

Scientists and industrial leaders of our country are today passing from a condition of conservatism to one of broad minded usefulness. We are, I say, in a transition period in which individualism is being slowly but surely displaced by rational communism. And this means the greatest good for the greatest number. Nowhere is this more evident than in the recent efforts made to determine the character and quality of the dyes used in coloring textiles. For this reason it seems fitting at this time to present at least an outline of a plan for the valuation of dyes for the benefit of the purchasing department. This method has for some time been developed and used at the Textile Trade Laboratory in Newark and is here published, not as a complete and perfect method but rather as a suggestion for further investigation.

This is the third of a series of articles on Laboratory Management. The first article was published in the January, 1918, number; the second in the July, 1918, number. Dr. Dannerth, a consulting industrial chemist at Newark, N. J., and at one time a member of the staff at the Pennsylvania Museum and School of Industrial Art in Philadelphia, has devoted much time and thought to this subject, which is believed to be the first attempt made to provide a system of laboratory organization for the textile industry.

The following points are determined: (1) The strength of the dye: (2) the money value of the dye; (3) the best method for applying the dye to fibers; (4) the fastness of a dye, after it has been applied; (5) proximate analysis of a dye.

In the case of silk we use a light fabric as this is easier to manipulate than are the skeins. A fabric weighing 2.0 ounces per square yard (boiled-off) is used. The sample used for the test weighs one gram.

In the case of wool we use a scoured worsted yarn or fabric. The sample used for the test weighs ten grams.

In the case of cotton we use a 2/20 yarn which has been previously boiled-off. If the dye is to be used in the factory for bleached yarn, the sample used for the test is bleached. The sample used for the test weighs ten grams.

The standard solutions used for the dyeing tests are:

Sulfuric acid: Of the 98.0 per cent concentrated acid (Sp.Gr. = 1.84) take ten grams and dilute this with water to 1,000 cc. One cc. of this solution equals very nearly 0.01 gram sulfuric acid.

Acetic acid: Of the 29 per cent commercial acetic acid (Sp. Gr. = 1.040) take ten grams and dilute this with water to 1,000 cc.

Sodium sulfate or glauber salt: Of the crystals take 1,000 grams and dissolve these in water to 1,000 cc.

Sodium chloride or table salt: Of the commercial salt take 100 grams and dissolve in water to 1,000 cc.

Sodium carbonate or soda ash: Of commercial soda ash take 100 grams and dissolve in water to 1,000 cc.

Soap solution: Use a sodium oleate soap or a commercial olive oil soda soap, having approximately 30 per cent water content. Of this soap take 10.0 grams and dissolve in water to 1,000 cc.

Dye solution: Take one gram of the dye. Use a 1,000 cc. flask. Dissolve the dye in the least necessary quantity of boiling water, and dilute with cold water to 1,000 cc. If the textile sample used for the test weighs one gram, as in the case of silk, and it is desired to use 1.0 per cent of the dye (based on the weight of the sample) it is necessary to use ten cubic centimeters of the standard dye solution. Or, if the textile sample weighs ten grams, as in the case of wool, it is necessary to use 100 cc. of the dye solution.

1. *The strength of the dye.* To determine the strength of a dye, measure out a volume of the dye solution equal to 2.0 per cent of the dye, based on the weight of the textile sample. One gram of silk fabric would then require 0.02 gram of dye (= 20 cc.). The swatch is dyed out according to the usual process for that particular dye, and the finished colored fabric is dried and then examined with the unaided eye in a good north light, to determine which is the fullest shade. This test is sometimes of value for comparing black dyes. In this case the dye should be applied in several strengths: (1) use 1.0 per cent of the dye; (2) use 2.0 per cent of the dye; (3) use 10.0 per cent of the dye; (4) use 20.0 per cent of the dye.

2. *The money value of the dye.* The method commonly used for control tests in European dye factories is based on a standard dye having an arbitrary value of $1.00 per pound. On examining a dye which has been offered at one dollar per pound we dissolve one gram of the dye in 1000 cc. of water. For the dyeing test we use a textile sample weighing ten grams, and we add to the dyebath 200 cc. of the standard dye solution. This is equivalent to 0.2 gram of dye or a 2.0 per cent shade. If another dye is offered to the purchasing agent in a textile mill, and the price charged is $0.75 per pound, we use: 100×200 cc. $\div 75 = 266$ cc. of the solution. Or if a certain dye is offered at 125 cents per pound, we would use: 100×200 cc. $\div 125 = 160$ cc. of the solution.

3. *The best method for applying the dye to fibers.* In cases where the character of a dye is unknown, or if a new dye has been discovered, it is necessary to determine the method best adapted for applying the dye to vegetable or animal fibers. For this purpose at least eight different baths are prepared with 1000 cc. of distilled water and the additions indicated. One series of tests is carried out with cotton yarns and another series is carried out with woolen yarn. In the preliminary tests, small ten gram skeins of scoured yarn are used, and 0.20 grams of dye are added to each bath.

Bath No. 1 contains no additions to the water whatever

(*Continued on page 776.*)

The Conference on Vocational Education

August 12th and 13th were the dates set for the conference on Vocational Education as it related to textiles. This conference was called by the Federal Board of Vocational Education through the officials of the Southern Commercial Congress and was held at the Piedmont Hotel in Atlanta on the dates named. The Atlanta Chamber of Commerce and a local committee of cotton manufacturers cooperated with the officers of the Southern Commercial Congress in issuing the call for this meeting. More than 100 representative delegates attended this conference which was held in the large auditorium on the 9th floor of the Piedmont Hotel.

A GROUP OF THE CONFERENCE ORGANIZERS.

Left to right: Front Row: Judge Robert W. Bingham, President of the Southern Commercial Congress; Leland Hume, Vice-President of the Southern Commercial Congress; Dr. C. A. Prosser, Director of the Federal Board for Vocational Education; W. D. Adams, Secretary of the National Council of American Cotton Manufacturers and Secretary and Treasurer of the American Cotton Manufacturers' Association; B. C. Lawhon, Assistant Secretary of the Atlanta Chamber of Commerce. Back Row: Dr. Clarence J. Owens, Managing Director of the Southern Commercial Congress; Hon. Hoke Smith, Senior Senator from Georgia; L. L. Arnold, Editor of Cotton; Orville C. Wainwright, Secretary and Sales Manager of the Stonewall (Miss.) Cotton Mills; and Walter G. Cooper, Secretary of the Atlanta Chamber of Commerce.

Judge Robert W. Bingham of Louisville, Ky., president of the Southern Commercial Congress, presided. He first called upon M. L. Brittain, superintendent of the State Board of Education of Georgia for the address of welcome in behalf of the state of Georgia. Mr. Brittain was followed by Mayor Candler of Atlanta who briefly welcomed the delegates to Georgia's capital city.

Clarence J. Owens, managing director of the Southern Commercial Congress then addressed the delegates outlining briefly the manner in which the Southern Commercial Congress had been drawn into this work on Vocational Education. He was followed by United States Senator Hoke Smith, the senior senator from Georgia and the joint author of the Smith-Hughes bill. Senator Smith made the principle address of the morning and outlined the educational history which lead up to the formation of the commission which framed the Smith-Hughes bill. At the close of this historical sketch, Senator Smith practically stated that Dr. C. A. Prosser, the director of the Federal Board for Vocational Education was the real author of the bill and was the man who practically prepared it and put it in shape for the legislative workers to handle.

Chairman Bingham then introduced Dr. Prosser and turned the meeting over to him for the balance of the morning session for a roundtable discussion on the subject in hand. In opening up the real subject of the conference Dr. Prosser spoke at some length and said in part as follows:

"I should be sadly lacking in gratitude and reciprocal spirit, nay more, I should be false to a resolution I made many months ago if I did not seek this very first opportunity when I find Senator Smith present at a public meet-

ing with myself to tell the real truth with regard to this bill. It is true and it is self evident that the passage of these two great measures through the senate and through the house are due almost entirely to the brilliant leadership of Senator Smith. He is too modest when he says the bill was prepared by other people. It is true that the text of these bills was brought by others and submitted to him for his action. I would not be fair if I did not say that these bills, after all, represent the collective action in conference after conference of almost countless people, too numerous to be mentioned one by one, some of whom are present in this room this morning, but when these bills went to Senator Smith, they were revamped in the crucible of his mind, revamped from the standpoint of a broad sympathetic understanding of not only what must be done to pass legislation successfully, but at the same time of the needs of the whole country.

"Now, Mr. Chairman, what I would like to do would be at the very outset to set up certain things which I think this meeting ought to accomplish before we adjourn tomorrow and then, insofar as I have anything to do with them, to keep driving away at those things. We are considering first of all how federal money under the Smith-Hughes Act can be used for the promotion of textile education in the South. There are several problems involved in that main question. The first is this: Under what conditions can we use the federal money for textile education in the South? Second, what are the problems involved in giving training for the textile business of less than college grade, because the Smith-Hughes Act has nothing to do with problems in education of college grades as that is a matter for the technical institutions? Third, what is the practical program which needs to be formulated for doing something—if we are all agreed that there is something that needs to be done and can be done? Fourth, how shall we put that practical program into effect?

"I would like to lop off some things at the start, so as to clear the situation. The Smith-Hughes bill provides for agricultural education, home economics education, industrial education, etc. We are concerned to-day not at all with agricultural education or with home economics education, as such, so we will lop those two off and say we are dealing with industrial education only.

"The Federal Government distributes to each one of the states, if they accept the provisions of the act, a certain amount of money for industrial education. The total of that fund last year was $500,000. The year in which we have just now entered beginning July 1st, it is increased 50 per cent, that is, it is $750,000. Next year it will be $1,000,000, the following year $1,250,000, and so on until 1925-1926 when the total for industrial education and trade education will be $3,000,000. These moneys are distributed among the states on the basis, as Senator Smith pointed out, of their population. The agricultural fund goes by rural population, the industrial fund goes by urban population. That means that this money is given to the different states of the United States in the ratio or in the proportion as the total number of people each of the states have within its borders living in communities having more than 2500 population. To single out a state, that means that the question of how much money Georgia gets for industrial education is dependent upon the number of people living in communities of 2500 or over which she has within her borders.

"The first thing that I want to make plain to you is that the Federal Board does not spend that money in Georgia or in any other state. It is spent by a State Board for vocational education created as required by the Smith-Hughes Act, through the Georgia legislature and the State Board for vocational education has an executive officer—in the case of Georgia in the person of Mr. Brittain, State Superintendent of Public Instruction for the state.

"This conference is simply called here by the Federal Board for the purpose of getting the various officials and the textile manufacturers together to talk over the question of the use of this money, but I desire to make it plain to you that the question of the actual securing of this money in any community for any purpose is a matter in the control not of the Federal Board at Washington, but in the control of the board for vocational education of the particular state in which that commounity is located. The Federal Board is charged by the act with disbursing this fund, but the law requires that the state board of the particular state shall put up a plan for carrying on the work, and it becomes the duty of the Federal Board under the plans of the Act, to see that this plan which the state presents is in keeping with the letter and the spirit of the Smith-Hughes Act and when that plan has been agreed upon and has been approved by the Federal Board, after conference with the State Board when necessary, then the matter of the expenditure of that money is entirely in the hands of the State Board."

At this point considerable discussion took place between Dr. Prosser, Senator Smith, Superintendent Brittain, Rogers Davis and Mr. Baldwin of Charlotte, N. C., which brought out the fact that the percentage of rural population in many of the Southern states was much larger in proportion to the urban population than the framers of the bill had realized. In the case of Georgia it was about 80 per cent rural population. The results of this became evident in the division of the Federal moneys under the Smith-Hughes Act, making the proportion for industrial education much smaller than it should have been owing to the fact that the large majority of cotton mill towns and villages throughout the southern states are not incorporated and do not reach the minimum limit of 2,500 population required by the Smith-Hughes Act. It was pointed out that while the small population of a mill village would work no hardship upon that village from the standpoint of securing funds for the furtherance of vocational education, the fact that the population of these towns was included with the rural population went far toward reducing the actual sum available for industrial purposes, which it was shown should have been much larger in many instances. This will be doubtless be corrected in future legislation.

It was brought out further that in the eleven states included in this southern district by the Federal Board, the predominating industry was textile manufacture and it was explained by Dr. Prosser that it was for this reason the conference in Atlanta had been called. Dr. Prosser then called upon a number of cotton manufacturers present to express their ideas in reference to the need for vocational education in the mills and particularly as to what class of people it would benefit.

J. M. Gamewell, general manager of the Erlanger Mills of Lexington, N. C., stated that mill managers recognized everyday the lack of education among their subordinates. "Take, for instance, our overseers," he said, "getting down to the practical end of the thing, a man can go just so far and then finds his limitations. A man comes to the mill, say when he is sixteen, when he has merely the rudiments of an education; he goes on and becomes a section hand and perhaps, later, a second hand and perhaps in time an overseer. Then what does he strike? He finds he hasn't sufficient education to go ahead and there he remains." Mr. Gamewell pointed out that in many instances these overseers were unable to reach the higher places such as that of superintendent, manager, or treasurer simply because they had insufficient training.

"If there is anything we need in our textile communities," continued Mr. Gamewell, "we certainly need to train these men along the theoretical lines that they are following practically every day. It might be said that our textile schools supply this want, but the trouble is that many of these young men when they graduate, come to us with this attitude, 'Well, I am ready to be a superintendent or a manager right now.' That isn't the proper theory. Such a man has no practical training and nine-tenths of them would fall down in a position of that kind. They fail to realize that they have to go to the bottom and come on up rather than to begin at the top as soon as they get out of school. So it is, after all, the everyday worker we should train, and I believe that we should train him on the ground where he is working as a part of our school system. That's my idea about it. It is certainly a thing we should all feel a great interest in and at our mill we are willing to back up the Federal Board in anything you are willing to suggest."

President Allen F. Johnson of the Exposition Cotton Mills of Atlanta expressed it as his opinion that "southern mills get men to fill most of their higher positions from the ranks of the workers, but there are few to select from. I know a great many superintendents," he continued, "who got their training and were able to go forward on their own personality and determination. Where you find one such man, there are dozens of other men who have been handicapped, who could have gone as far or farther with the assistance of this Board and the aid it has to offer. Speaking for the mills in the state of Georgia, I can say that they are intensely interested, and that they are willing to co-operate, because they feel the need of this particular work and I think that it will be of more effect in the mills here than in the mills of some sections, because of the personal good feeling existing between the management and the operatives. In other words, the operatives of the southern mills are the same kind of folks we are. They are a pure Anglo-Saxon strain and we feel close to them. They are ready to be helped, and if you could get this machinery in motion I feel that you will have all the co-operation that can be given from the mills. There have been a great number of mills in Georgia who are outside the corporation limits of any town. They have, therefore, been responsible for the schools in their mill villages. It has been up to the mills to run the schools, and many mills have put up two dollars for every dollar put up by the State of Georgia from the public school fund. I believe the mills of Georgia will put up a dollar at least and probably more than a dollar to match every dollar the Government puts up."

O. C. Wainwright, secretary of the Stonewall Cotton Mills at Stonewall, Miss., was then called upon by Dr. Prosser for his idea on this subject, and he stated that the antagonism between capital and labor had been a subject for the master minds of the world for many years and that during this period capital on one side and labor on the other had looked at each other suspiciously whenever any new move was made, in the fear that the other was trying to take some undue advantage. "That impression has continued for a good many years," continued Mr. Wainwright, "and I am glad to see that it is beginning to die away in our line of business for the reason that the mill managements are beginning to appreciate the fact that their labor is reaching that stage, or has reached that stage of ignorance where their business cannot be carried on successfully unless these operatives are educated along the lines of the business with which they are connected.

"That's the problem that confronts us today. It is a problem that was spoken of a few moments ago. We have in our industry men who should be trained in their own line of work. I knew a man once, a telegraph operator, who gave 40 years of experience as a telegraph operator as a reason why he should have a position. As a matter of fact, he wasn't a telegraph operator inasmuch as he had only had 40 years experience doing nothing. He hadn't attained success in his line because 39 years ago he was a telegraph operator. I feel there are cotton mill men who are in the same position; who have had 40 years of experience, and who are not cotton mill men any more than a chicken, because they realized 39 nine years ago that they could run a mill, that is operate it successfully. In my opinion, in order for us to make money, we must have around us people who are trained, people who have money in their pockets. Who wants to live in a community where everybody is just so poor that they can get barely enough to eat and just clothes enough to wear and with just a few people with plenty of money? It isn't a comfortable position, is it? I want to see my people prosper, and in order to be able to get the most money out of the positions they are in, they must have some training or they will not be worth more money, and they cannot get more money unless they are worth it. Therefore, it seems to me that it is up to the mills to wake up to this proposition and to be broad enough to aid the laborers who are working around their plants to go further with their educational activities."

J. F. MacEnroe, assistant treasurer of the Ware Shoals (S. C.) Manufacturing Company, said that the manufacturers of South Carolina were greatly interested in the question of better education. "Actions speak louder than words," he continued, "I believe that South Carolina spends about $3.00 per capita upon education. Last year we had nine teachers in our school in Ware Shoals and have been conducting a night school for the last five years in which last year we had four teachers. I believe we spent about $12.00 a head on the pupils. We need more money and we are here to see how we can get some of that appropriation. We find our people need education and while we have one of the best mills in the South, probably 25 per

cent can not read or write. It's a deplorable condition, but we are really no worse off than some of the other mills."

J. B. Young, general manager of the Jackson Fibre Co., at Bemis, Tenn., indicated the interest of his organization in the question of vocational education by stating that the president of his company had for many years advocated that the mill should conduct a textile school on its own account. In this, Mr. Young indicated that he disagreed somewhat with his president inasmuch as he felt that the organization was too small for a proposition of that character.

"We have a town of about 1800 people," he said, "and our company owns the entire town. We have two school buildings for white children and one for colored children. We built these buildings entirely at our own expense, the three buildings costing a little less than $20,000. The county pays the teachers in part, that is they pay all they can afford, or think they can afford, and we pay the rest. We have two teachers in the colored school, a man and a woman (colored people), and eight teachers in the white school including the principal."

Mr. Young indicated that he did not believe textile education insofar as operating the individual machines were concerned, would amount to very much for the ordinary operative. He advised that these operatives could learn to operate such machines in a very little while after they began to work and insofar as the children were concerned he felt that when children were 16 they were too young, or in other words it was the wrong time to give them the textile training which they might appreciate later. After they finished grammar school or after they have a common school education he thought they would be in a better position to assimilate textile training.

Mr. Young pointed out that his mill would be very glad to do its full share in co-operating with the government in anything that they thought could be planned to introduce vocational education among the workers. Then, referring to the remarks of Mr. Gamewell in regard to better educational facilities for second hands and overseers, he continued: "We have got men in our employ now, I know of one man in particular, he is a capable overseer and it seems to be bred in him to manage people under his control. He does it with very little friction. He hasn't acquired that in any college, because he never went to school and it is just as much as that man can do to write his name. He couldn't keep his own payroll without the assistance of his daughter. If a man like that had the proper training to start with he would be all right.

"I can give you another instance. A man came to us when he was a little boy—I say a little boy, he was about fifteen years old. He went to work in the card room; didn't know his letters, even. He went to our night school (we conduct a night school too), studied hard and got along. Finally we made him a second hand; later an overseer. He is a capable man, but if he hadn't had this training in night school we could never have put him in such a position. Now if you take a man like that, and suppose there was a school a man could go to that would give him vocational education or vocational training, whether that was a night school or not, if that enabled him to be an overseer if he has the right kind of qualifications he will get to be a general manager. In my opinion this proposition is a great thing and worthy of all the co-operation we can give it.

"I think this question of vocational education is a step in the right direction. It is just a question of how it shall be applied. I think that this is the part of the problem that ought to be considered, and as Dr. Prosser has said, the way to do it is to ascertain from the textile men, the practical men, the men who are in there and know what the demands are, how to reach the greatest number to accomplish the most good.

At the suggestion of a delegate Dr. Prosser asked Mr. Young to indicate what success he had been having with same textile classes that were being conducted at his mill. In this connection Mr. Young stated: "Our textile classes are conducted in the night school. This night school usually employs two teachers, the principal takes one department and one of his assistants the other department for the night term, and they have three sessions a week at night. The class of people we get to these night schools are boys and girls who have been raised in the rural communities where they haven't had any school advantages whatever. They come to our mill to get a living and they didn't know that they didn't have any education until they came there and found boys and girls younger than they were, who knew a whole lot more and who could read a paper and do all that sort of thing, and this aroused their desire for an education. Some of these boys and girls would attend the night school. We went so far even as to pay them a dollar a week to go to night school. That didn't seem to encourage many more to go than it did when we didn't pay them and so we let it go and didn't pay them. In the case of the older boys, the ones who have gotten to be 16 to 20 and felt that they wanted more education, we found it worked the best to let them pay a dollar.. Now they pay a nominal fee (a dollar for the whole term) and they are more interested because of this. In the case of the textile classes we conduct these in our Y. M. C. A. building and we have two classes, the junior and senior classes. The junior teacher isn't a practical textile man, the one in the senior department is the son of one of our foremen We also have a mechanical engineer, a graduate of the Boston School of Technology, and he takes the class one night a week. The engineer takes it another night and so on, divided around, and occasionally they have some one come in and give lectures. They have been quite successful although we haven't accomplished as much in the textile classes as we would like to."

Dr. Prosser then announced that several things seemed to stand out from the morning's discussion. One of these was that there was a need for textile training; and the second was that there seemed to be a conviction on the part of the cotton manufacturers that such textile training could be better assimilated by persons eighteen years old or over who had acquired some practical experience in the mills and realized the need for a better theoretical groundwork.

The conference then adjourned for luncheon.

The Monday Afternoon Session.

At the Monday afternoon session the question of the different methods of vocational training was taken up. It was pointed out that one method would be to embody vocational training classes in the curriculum of regular high

schools where such high schools were available. As indicated from the morning discussion this method of procedure was not favored by the cotton manufacturers, first owing to the inability of such young minds to grasp the necessities of such training, and second, the lack of conveniently located schools of this grade which might be attended by the mill village children.

The second type of vocational training taken up was part time training. Part time training is simply vocational training related to the job. It is usually given on the time of the employer to his employee but under such conditions of production as to make it of no substantial expense to the employer and of no expense at all to the employee. It was pointed out that this method had been adopted in several mills by working two shifts of young people alternately a half day in the mill and the balance of the time in school, the mill paying for the time in both instances. It was also developed that such part time education could be arranged on the basis of alternate days, or alternate weeks. This was a matter, Dr. Prosser pointed out, to be adjusted by the mill organizations in accordance with the best interests of the mill and its employees.

The third type of vocational training was embodied in the evening schools and evening classes a more or less full discussion of which had been brought out in the morning session.

Following this round table discussion Acting Chairman Owens introduced Dr. John W. Abercrombie, Counsellor of the United States Department of Labor who addressed the conference at some length, largely upon the labor and educational conditions arising as a result of the war. Adjournment was then taken until the

Tuesday Morning Session.

The session on Tuesday morning was called to order by Jodge Robert W. Bingham who introduced Ex-Congressman Dudley M. Hughes the second sponsor for the Smith-Hughes Act who briefly reviewed his connection with this bill and the possibilities arising from it as he felt them.

The meeting was then turned over to Dr. Prosser who delivered a brief eulogy on Ex-Congressman Hughes, and reviewed the work of the previous day for the benefit of the very much enlarged audience in attendance. He said in part:

"There was unanimous agreement upon the proposition that there was need for the training of textile workers. There was also unanimity of opinion, so far as I know without dissent, upon the proposition that there not only was need for the training of the textile workers, but that there could be training given which would be of very great advantage to them. In other words, it was not a thing that was impossible—that was financially impossible or, to use the language of the school-master, that was pedagogically impossible—it could be done, it was somewhat a simple proposition.

"Now, from that background, we begin to work into the rest of the program. I would like to say two or three things to this group as a whole that I didn't say yesterday. Some of it may provoke some discussion—I hope it does. I have this indictment to lay at the door of the employer of juvenile labor in this country, that up to within very recent times his attitude towards the whole proposition has been that of opposition, rather than of construction, and I'm not so certain but what to a very great extent, he shot his grandmother. What do I mean by that? This is not a new problem: we have had the situation with regard to the textile workers in Massachusetts: we have had the same situation with regard to other juvenile workers in other states of the Union, Wisconsin, for example, and taking them as a group, the policy of the manufacturers, the employers—I hope you will take this from me in no critical way—has been to resist all these restrictions put upon the employment of the juvenile, rather than get above the problem and look down upon it in a constructive way.

"I have the same indictment to put at the door of the child-labor enthusiast, the person who is interested in the whole problem from the standpoint of taking the juvenile out of industry. They have become so imbued with certain very glaring situations, which here and there careless or indifferent or grasping manufacturers have brought about, that they have looked upon the whole matter of the employment of the juvenile as an iniquity to be combatted in every possible way. This brought the fight for fourteen and fight for fifteen and fight for sixteen years of absolute straight attendance upon school without any work in school involved in it; and the result is that in many states of the Union today the children have to remain, most of them, in unreorganized schools of the old type, doing work for which they are not adapted, in which they are not interested, about whose value for them, from the standpoint of what they are going to do, there is a very great question.

"Now, I have an idea that it would be best for a great many hundreds of children of the kind I know to do some work, between fourteen and sixteen years of age; (Applause), rather than to go to school all day in the types of school we have thus far established, and I have sometimes dreamed the dream of a group of men in the manufacturing business joining hands with labor and joining hands with the educator, and let us hope, joining hands with the child labor enthusiast, who will see we will put up a program of education for the child at fourteen years of age who isn't doing what he might do, or what others do, in regular class and high school, or who has to go to work; and we will put up a combination of work and play and education for those children between fourteen and sixteen years of age in sanitary, well constructed manufacturing establishments, carefully supervised tasks and a small number of hours of work, reasonable in number, half the day—ten hour day, five hours school and five hours out; or an eight hour day, four hours in school and four hours out, and we will take those four hours when they are out of school, during that period, for the purpose of making life worth while to these young people, of making them the kind of citizens this country has got to depend upon in the future, of making them the kind of workers that the manufacturing establishments, for their own sakes at least, ought to be interested in maintaining.

"Now, it is from that background I am talking, and I would like to see tried out squarely in this country, in some place, by legislation, a compulsory system of work and play, for after all, you know, w-o-r-k is the most educative thing in the world. The trouble about it is overwork! The trouble about it is purposeless work! The trouble about it is indirect work! The trouble about it is

uneducative work! That's the only trouble about work. But character is made and fiber is made and brain is made, as well as muscle, by the discipline of patient, orderly, systematic toil, and when you take that out of the lives of boys and girls, so that you set them aside in a nunnery, in a cloister, until they are sixteen years of age, you may think you are educating them to the best advantage; I certainly question it very seriously indeed.

"Now, it is from that angle alone I'm talking to you. I'm talking about this not officially, it isn't any attitude of the Federal Board, it is my own statement, it is as I see it, that I question it; further, unless we can revolutionize the American schools—I think we can revolutionize them, although I think they are going along and getting along most gratifyingly in some places—I question whether from the standpoint of constructive policy, the textile manufacturers of the southern states are not missing a golden opportunity from the standpoint either of their own business or of those children, in whom, I am very thankful to say, there was abundant evidence yesterday they are beginning to take a very deep interest."

THE CHAIRMAN: "I think, ladies and gentlemen, we have had the privilege of hearing the most admirable, a most hopeful, as well as well as helpful, a most constructive programme certainly that I have had the privilege of hearing. I would like, as Chairman of this convention, to go unreservedly on record as supporting it *in toto;* and all of those who are in favor of that will please make it known by rising." (The motion was unanimously carried, amid great applause.)

DOCTOR PROSSER: "I am very grateful for that, Mr. Chairman. I believe you will agree with me, he concluded, that children of 14 to 16 years of age are of little real value to the mill."

At this point Chairman Bingham introduced James B. Munroe, president and treasurer of the Munroe Felt Manufacturing Company and vice chairman of the Federal Board for Vocational Education who addressed the conference at some length on the situation as he saw it.

Dr. Prosser then continued his discussion, referring to that section of the act which related to home economics and the scope of the work allowable under that clause. He then introduced T. E. Browne, director of vocational education at the State College of Agriculture and Engineering at Raleigh who described briefly the work already accomplished along these lines in the state of North Carolina, saying in part:

"When we first began to make demands in our state for the use of the Smith-Hughes fund, we thought that the industrial fund was so small we didn't pay much attention to it, and we were just about to pass over it without writing into our plan the plan for using this fund, when Roy Dimmit, our Federal Agent, came up there and had a conference with our State Board for Vocational Education, and in that conference, with his tactful suggestions and his fine feeling towards the great field of industrial education, there began to evolve from that conference a desire to utilize this money, and when that desire began to develop, we looked over the field in North Carolina, and naturally, because of the fact that we have more than 300 cotton mills in the state and a larger number of workers engaged in cotton mill work than in any other vocation except productive agriculture, we naturally felt that this fund should be used in the development of vocational courses for the cotton mill workers, and right there, that day, before we adjourned, a plan was evolved and prepared to submit to the Federal Board, making arrangements for the introduction into the mill villages in North Carolina of vocational classes for mill workers; and it is the plan of our state to use largely, almost entirely, the fund accruing to the state with the exception of the twenty per cent to be used for home economics, for the training of the cotton mill workers.

"When we began to think about the best means of introducing these courses, we were more or less at loss to know what should be done. So we decided we would undertake to employ a trained mill man, a man who was trained in the technical phase of cotton mill manufacturing, and who had had actual trade contact, years of experience, who would go into certain centers and there establish evening schools for the cotton mill workers, and we employed a man from the New Bedford mills, who happened to be a graduate of our own college of agriculture and engineering, then it was up to him to approach the mill men to see their attitude, and we sent out a letter to several of the leading mill men in North Carolina and found a very ready response.

"We began about six months ago at the Roanoke Rapids Mills and Weldon Mills with the establishment of evening classes for mill workers, and for three months there, or twelve weeks, we conducted evening classes in Roanoke Rapids Mills and in Weldon Mills, alternating. At the end of that time, we had secured such an exceedingly good man for this work that those mill men wanted him, and when his term of office or teaching was over the mill men of Roanoke Rapids offered him such a good salary as superintendent of one of their new mills that we lost him.

"Now, I see trouble ahead in our scheme. If we get the high class man necessary to do this work and he proves himself the efficient mixer and manager we want him to prove, I am afraid you mill men are going to want him for your own commercial business. If there were plenty of these men we wouldn't object to that, we would like to place a man of this missionary spirit in every mill community, but with the scarcity of men of that type, I don't know how we are going to be able to find enough of that type for each community where we are going to establish a school. We were fortunate in getting a man who had worked with Mr. Dean to come down and take up this work. So after we had finished the work at Roanoke Rapids and Weldon, we started a class at Lumberton, and right now there is being conducted at that place a class of evening instruction. Now, by that we don't mean that these classes are all held at night. We have a class held in the day, but it is evening instruction for the mill men, who are employed during the night—it means outside of their regular term of employment.

"The attendance hasn't been what some of the mill managers expected, they started with pretty large enrollments, to begin with, but our average enrollment has stood right around ten or a dozen, and I want to say that they are usually the highest paid men, section hands and second hands and overseers. We haven't been able in those classes to reach the men lower down in the scale yet, we hope to do that through the influence of the men higher up. When

we have finished with the work at Lumberton, we go to another center, and in our efforts, we try to establish those centers in the leading geographical sections of the state as regards the cotton mill business. We went to Northeastern North Carolina and then Southeastern North Carolina, and then up into the Piedmont, with the hope that when those schools have been conducted for awhile, it will be a center of influence from which will emanate a desire to establish more of those schools in that section of the state. It is our desire, furthermore, not to stop with this twleve weeks' course. We hope while this teacher is there, he will be able to select from the mill a man of outstanding ability, or men of outstanding ability, whom he can teach and train to be teachers and who will take up this work when he has gone to another place and conduct evening instruction for those mill workers, because we wouldn't feel that we were justified in just going into a center and doing twelve weeks work and stopping there. We hope to make it continuous, right on through, from the utilization of local men right from the mills, we know by that means the small amount of money that we have available in the state is going to reach a larger number of workers, and that's what we want with the money available."

Following Mr. Browne's interesting talk, Dr. Prosser called upon Geo. S. Harris, superintendent of the Lanett Cotton Mills at West Point, Ga., who advised that the management of his group of mills had given considerable thought to this very interesting question. With an investment of approximately $7,000,000 they had devoted practically 10 per cent of this sum to buildings and equipment for the education and uplift of their people. Mr. Harris then gave a brief outline of what had been accomplished in the various villages connected with this group of mills and concluded with a frank admission that "We don't know how to do it. We wish some one would come down to us and tell us the best way to handle this whole proposition."

After some further discussion, the first session of Tuesday was concluded for luncheon with instructions to reconvene at 2 o'clock.

Tuesday Afternoon Session.

As the first speaker at the afternoon session the chairman introduced Arthur E. Holder of Washington who gave an interesting talk on some of the general features of the subject.

Dr. Prosser then called upon Miss Dozier of the Pacolet Mills of New Holland, Ga., who described the experience and success they had attained at this mill with a part time school which they had had under operation for something like nine months. In this connection superintendent of Georgia schools, M. L. Brittain read into the records the exact conditions under which this school at New Holland operated.

While on this discussion Geo. B. Haslam, treasurer of the Coosa Mfg. Co., at Piedmont, Ala., was called upon and gave his experience with part time schools at his mill as well as with evening schools of a similar character. It developed during the course of his remarks that beyond a very brief preliminary education, he had concluded his education at evening school while employed during the day in the mill.

B. W. Bingham, general superintendent of the Ozark (Ala.) Cotton Mill Company advised that they had in operation a very successful night school at which one of the overseers of the mill acted as teacher. He claimed that this school had a good attendance and was accomplishing much along the line of general mathematics and common school educational work.

After considerable further experiences Dr. Prosser then concluded the discussion with the statement that this meeting was a sort of a preliminary skirmish to find out the very best way to work out a system or systems to fit the different circumstances surrounding the many different mills in the southern states. He suggested that perhaps the best way to handle this proposition was to employ a special man to make such an investigation and prepare a report which could be printed and distributed among all the mills of the South. Dr. Prosser was assured in this connection by secretary and treasurer W. D. Adams of the American Cotton Manufacturers' Association, who was present, that the American Cotton Manufacturers' Association would be glad to cooperate with the Federal Board in this connection. Secretary Adams then read a number of resolutions all of which were unanimously adopted and of which the following are the more important:

WHEREAS: Appreciating the vital need of practical industrial training among textile workers in the South so as to better qualify them for their respective tasks and recognizing the wonderful opportunities of such service for the benefit of all concerned and the accruing benefits to the country at large.

THEREFORE BE IT RESOLVED: That it be the sense of this convention that every consideration requires the establishment, as rapidly as possible, of a comprehensive program for the training of textile workers. To the end that this be done, we recommend the following steps:

1. That the Federal Board for Vocational Education undertake at once an investigation leading to the establishment of practical experiments in the training of textile workers to meet the needs of the workers and the industry.
2. That this study be undertaken in co-operation with the State Boards for Vocational Education in these Southern States where textile mills have been established and with the American Cotton Manufacturers' Association and its affiliated state cotton manufacturers' associations.
3. That this investigation terminate, if possible, in the establishment of at least one scheme of training for textile workers in each of the States.
4. That as soon as possible after the establishment of these training schemes, a report be issued by the Federal Board which shall give special attention to the schemes which have been established as a result of the investigation.
5. That the investigation and report shall also deal with the possibilities of the training and employment as textile workers of disabled soldiers and sailors returning from the war.

RESOLVED: That the attention of the State Boards for Vocational Education in those Southern States where cotton mills have been established be called to what this convention regards as being an inequitable distribution of Federal moneys under the Smith-Hughes Act as between agricultural and industrial education. The national fund for agricultural education is distributed among the States in proportion to their rural population living in communities of less than 2,500. The national fund for industrial education is distributed among the States in proportion to their urban population living in communities of more than 2,500 inhabitants. A great many of the textile mills of the South have been established in suburban communities, small towns and remote districts having a population of less than 2,500 inhabitants. Although these textile centers need industrial education greatly, their population is under the scheme of distribution of Federal moneys by the Smith-Hughes Act, counted as rural population, thus swelling the agricultural fund and reducing the industrial education fund allotted to a state. We recommend that each State board concerned give careful consideration to this inequity and present to the Federal Board for Vocational Education its recommendation as to what should be done to correct it.

COMMITTEE ON RESOLUTIONS.

Allan F. Johnson, Chairman, Chairman of the Board of the American Cotton Manufacturers' Association.
W. D. Adams, Secretary of the National Council of Cotton Manufacturers.
J. M. Gamewell, General Manager of the Erlanger Cotton Mills Company.
M. L. Brittain, representing State Board for Vocational Education.
Chas. S. Doggett, Director Textile Department, Clemson Agricultural College.
C. A. Prosser, Director Federal Board for Vocational Education.
Arthur E. Holder, Member of the Federal Boad for Vocational Education, representing labor.
Leland Hume, Vice President of the Southern Commercial Congress.
Clarence J. Owens, Managing Director of the Southern Commercial Congress.

Read "Going After Latin American Trade." Begins next month.

A Chinese Cotton Manufacturer

In the March 1918 number of COTTON it was our pleasure to present to the readers a very complete illustrated description of China's only textile school, located at Nantung Chow, a city situated on the Yangtze River. This city, which has not been opened to foreign business as a treaty port, has therefor escaped the attention of all except comparatively few people as a community that has made great strides in developing education, social institutions, public works, manufacturing enterprises and agriculture. It is believed that the example set in this community will exert a powerful influence on the whole of China

While Mr. Ben Y. Lee in his article in COTTON in March presented a brief outline of the character of the man who was the founder of the Nan-Tung Textile College and mentioned a few of the numerous philanthropic activities in which this man was interested, it has remained for Mr. Frederick R. Sites in the July number of "Asia" the journal of the American Asiatic Association, to tell the complete story of this Chinese philanthropist, His Excellency, Chang Chien, whose enterprise and wise leadership have been the mainspring of this progressive community betterment idea.

Following are brief extracts from Mr. Sites' descriptive article, which, as is always the case with articles on the far east in this well known publication of the American Asiatic Association, is very complete and contains much of human interest and educational value.

HIS EXCELLENCY, CHANG CHIEN.
(Courtesy of Frederick R. Sites.)

Chang Chien was the son of modest farmers of Kiangsu Province. The generosity, love and devoted labor of his elder brother enabled him as a child and as a youth to study the classics. He attained one high literary degree after another by passing with credit the several examinations. He was privileged to wear in succession on his hat the various honorary buttons: first, the brass button, later the white one, and then in their order the crystal, the light blue, the dark blue, the coral and finally, the red. At last he became Dean of the Hanlin Academy, the pinnacle of all literary attainments in those Imperial days. In honor he ranked above everyone else, save only the Emperor and the Empress Dowager. For him, who was once a mere farmer's boy, the main central gateways of the Palaces were now thrown open.

Until he was nearly forty-five years of age—and that was about twenty years ago—he did not enter actively into industrial life. Like some of our own great men who have recently become world leaders, he lived an academic life as a professor and head of colleges in provincial capitals. He was a careful observer, a deep thinker and a courageous writer. Fearlessly he memorialized the Throne on the need of political, social and economic reform in the Civil Service, the Administration of Korea, the Likin Tax, the Currency, the Salt Revenue. About 1880, in one of his memorials, he outlined the vigilant policy which China should adopt to protest the sovereignty of Korea and the safety of Manchuria against the activities of Japan. This, as well as most of his suggestions to the government, remained unheeded or were pigeon-holed because of the selfish, blind indifference of the old Manchu regime.

Quite contrary to the usual ambition of the Chinese youth for political preferment Chang Chien as a young man purposely kept out of official life, except once, when at the age of twenty-five he was sent to Korea under General Yuan Shi-kai, as Secretary to the Army in the days when Korea recognized the Chinese Emperor as her protector. Other tempting offers of a political nature he discreetly declined, for he knew that the deteriorating Manchu dynasty would not support his projects. Later, however, when China had thrown off the burden of the Manchu and when his friend Yuan Shi-kai had become President, he was persuaded to enter office—first as High Commissioner of the Salt Administration, then as Director of the Hwai River Conservancy, and finally, as Minister of Agriculture, Forestry and Commerce.

It was in this last position that he found the opportunity to put into execution long contemplated projects, which

he entered upon with great enthusiasm. He mapped out a great conservancy plan, in which the cooperation of the American Red Cross was enlisted, for reclaiming hundreds of square miles of land, the prey of the Hwai River floods. He established two experimental farms for the improvement of cotton, wheat and other crops in the several climatic zones of China and for the development of a better grade of livestock. He gave new life to the Forestry Bureau, with the idea of reclothing eventually China's bare and storm-washed hills. He developed special banking facilities to encourage industrial development. Under his regime China listened attentively to his proposals for her development.

But after a promising start, it became evident that the President, Yuan Shi-kai, was losing interest, due apparently to his absorption in his own personal affairs. Before long he was so completely engrossed with plans for his assumption of an Imperial Dynasty that affairs of public benefit were cast aside. Chang Chien found that it was futile for him to continue to try to carry out his great projects. They had lost the sympathy and support of the President. He therefore gave up national affairs to retire to his own home district and city, disappointed, but determined to succeed by adopting the more modest but possibly more effective program of making his own locality a model one, a definite pattern which might be followed in other cities in China. The result of this determination may be seen in the development of Nan-tung Chow.

The first practical work was started about nineteen years ago. Capital was subscribed liberally by his acquaintances and other investors who had implicit confidence in his integrity. A tract of about 119,000 *mow* (or 20,000 acres) of wild land—salt marshes along the seashore—was diked to keep out the ocean storms, and ditched to drain off the salt water.

After eleven years a second land company was started. During the last five years four additional companies of the same sort have been launched. These enterprises will provide work and subsistence for three million Chinese families.

A unity of plan is a notable part of Mr. Chang's educational system. His scheme provides practical industrial opportunities for those young men and women who have already been given special training in the colleges of commerce, agriculture, medicine and textiles. Their training prepares them for subsequent usefulness in the many enterprises under Mr. Chang's direction—the transportation companies, land development organizations, hospitals, cotton and flour mills. This logical program of special training and immediate opportunity for active participation in the work of the community is far in advance of the vision and plan of educators in many Western centres.

A visitor sees in the vicinity of the Agricultural College experimental fields bearing heavy crops of Sea Island cotton, sugar cane from America, selected wheat for specific kinds of soil, attractive orchards of apples, pears and figs and groves of bamboo and mulberry. There is a School of Embroidery with 100 young women who are studying under the instruction of a Chinese lady of renown, the most skilled artist in embroidery in China. The course of training includes drawing and painting as well as needle work. In another school an antique art is being preserved by the teaching of tapestry weaving. A public library has been built and equipped with 113,000 volumes. This library is housed in a charming group of buildings, well lighted, and set amid gardens which are fragrant with roses and bright with the red glow of the berries of the "Heavenly Bamboo."

The social institutions are equally representative of a spirit of progressive enterprise; among them the home for destitute old people, a distinct novelty in China. Such homes are not generally considered necessary, for it is the chief ambition of every Chinese man and woman to have children to support them in old age and to offer prayers and sacrifice for their peace in the spirit world. Consequently, old folks generally have ample means of support. But there are exceptions to this rule, and the home in Nan-tung Chow is filling a real need. There you will find over 100 old men and women, all happy and well, industriously at work making baskets, shoes and furniture, but apparently having plenty of leisure to enjoy their tobacco and to assemble smilingly at the request of foreign visitors, to have their picture taken. The Door of Hope, a refuge for ill-treated, unfortunate girls, is a splendid philanthropy established by Mr. Yang, Superintendent of Police, and his charming wife. Under their supervision many girls have been reclaimed from a life of slavery, taught the essentials of a good housewife, and additional accomplishments in the way of remunerative needlework, and have then been honorably married. Space does not allow detailed description of the hospitals, the orphanage, the institutions for the deaf, dumb and blind, the insane asylum, or the beggars' home. There are five public parks in Nan-tung Chow connected by winding driveways and artistic bridges and separated by lakes and grottoes. These are among Mr. Chang's more recent projects.

One of the secrets of the success of Chang Chien is a pledge he made himself twenty years ago to initiate each year two new constructive projects. He has kept his promise and has done even more during certain years. Last year's projects included the establishment of these five public parks. This year's projects include an automobile road to the famous Lang Shan Hills, and next year he plans more roads, more dikes for flood prevention, and a school for silk culture.

The cotton mills he controls were among his first projects, and are now nearly twenty years old. They contain about 70,000 spindles and employ 3,000 operatives. A park for the use of employees is maintained nearby. They are encouraged to save a portion of their earnings, and six per cent interest is paid to them on their savings accounts. Five per cent of the profits of these mills is set aside each year for the general philanthropic and educational work of the Nan-tung Chow district. The textile school with its 150 students is conducted in conjunction with the mills, as described in the March article.

Many another Chinese business man could be named, however, of equal courage and integrity, doing his share, and a large share, towards the industrial development of China and the betterment of her people. Such men are the bulwark of China and their influence will be felt increasingly in affairs of state. Their sincerity and their altruism should eventually offset the vicious selfishness of the politician and military chiefs who have been making a farce of the Government.

What you can Next Liberty Loan

Read this carefully—then ACT

THE three Liberty Loan issues already successfully floated have been put over by the win-the-war spirit of the American people.

In connection with the great work of awakening and quickening to action the spirit of war sacrifice which has been the greatest factor in the success of Liberty Loans it would be impossible to put too high a valuation on the splendid volutary work of American business men, bankers, labor leaders, and moulders of thought in all professions and occupations.

The very success of this volunteer leadership in creating enthusiasm has shown the desirability of organized methods for increasing its usefulness. And particularly to suggest to those leaders who feel that their circle of action is relatively small the enormous amount of good they can do as a whole *if each no matter how small or great (relatively) his sphere may be, will act with enthusiasm and system.* The great factory or store, society or club, church, or other organization with, say 5000 employees, members, or audience, does a great work in "selling" the Liberty Loan idea to such an aggregation. But that work is fully matched in aggregate importance by a hundred such institutions whose average payroll, membership, or audience, comprises only fifty persons each.

The nation has much other work to do. The Liberty Loan drives are necessarily carried through largely by volunteer work. In consequence they must be limited to specific brief periods for the actual subscription to the bonds.

THESE brief sharp campaigns have the advantage of building up white-hot waves of enthusiasm, but it is extremely difficult in such periods to secure close contact with all the wage-earning and money-making units of the public and especially to bring home personally to each individual the important serious personal relation which he or she should have to the war and to the successful financing ot it.

To the accomplishment of that great end it is now proposed that the leaders of thought and action in America and especially the employers of labor, great and small, whether in store or factory, whether engaged in production or distribution,

hold a meeting of your employees shortly previous to the Fourth Loan campaign, not to take bond subscriptions but to arouse serious enthusiasm for the forthcoming Loan.

WHERE organizations are small, as for example small stores, similar organizations in the same or related lines of business can be invited to participate in one meeting. As for example, all the grocers in a small city, or all those in a given section in a large city, might get together in one meeting. But it would be a grocers' meeting. In such cases it would usually be wise to keep related trades together.

Whether the audience be great or small, every effort should be made to "stage" the meetings effiectively, to make them interesting and instructive and above all to give employees themselves an opportunity to speak, to discuss, to suggest, to enthuse their fellow employees.

"Win-the-War" Meetings need not be limited to gatherings of employees. They can be equally effective if organized as "town meetings"—or by clubs, societies, churches, lodges or similar institutions. Leadership, organization, and a definite program will work wonders.

do NOW to help the

It is not essential that such meetings be called Liberty Loan meetings—they would better be announced as "Win-the-War" meetings, and above all it should be made clear that no attempt will be made at these meetings to secure or accept subscriptions for Bonds or money for any purpose whatever—but in all the speaking and discussion attention should be largely devoted to the forthcoming Loan.

The Fourth Liberty Loan Campaign will begin on September 28th.

All of the preliminary meetings should be held not earlier than September 10th and not later than September 25th, unless there are special circumstances which would make an earlier or later meeting expedient.

THE LIBERTY LOAN BUREAU has prepared a booklet setting forth "Suggested Programs for Meetings to Prepare for the Fourth Liberty Loan."

They have asked us as publishers of a business paper to bring this suggestion for patriotic service to the attention of our readers and to urge its hearty adoption by all stores, factories, employers of labor in any capacity, societies, clubs or organizations of any kind who can arrange such meetings.

We have been furnished with copies of the booklet giving "Programs for 'Win-the-War' Meetings"—and will send a copy promptly to anyone signing the coupon below and mailing it to us. The signing of the coupon is your pledge to hold such a meeting either of your employees or of some similar group which you can bring together previous to the Fourth Liberty Loan Campaign and your pledge when received will be turned over to the Liberty Loan Bureau and officially acknowledged.

Such meetings organized in the "Win-the-War" spirit will not only help tremendously to insure 100 per cent subscriptions to the Fourth Liberty Loan among employees of industrial and commercial concerns, they will do more than almost any other one thing could to develop among all ranks of the public the stern spirit of sacrifice and the necessity for loyal, constant ,steady service of each and every one in the great national work of victory for the cause of Liberty and Democracy.

They will serve to educate and make clear to all the vitally important way in which work and sacrifice here in our midst help and sustain the work of our fighting men "over there."

This is an opportunity for every American business man to do a great and helpful work for the Fourth Liberty Loan and one which will help win the war.

There is plenty of time for efficient action. There is no time to lose in preparing for that action.

COTTON.

Sign the Coupon
Mail it to
COTTON,
Atlanta, Ga.,
Get the Book
Hold Your Meeting
and
make it a
"hummer"

This space contributed to the winning of the war by
The Publishers of Cotton.

I pledge myself to organize and hold a "Win-the-War" meeting previous to the opening of the Fourth Liberty Loan Campaign in order to help float the Loan.

Send me †.... copy of Liberty Loan Committee Booklet giving suggestions for Programs for such meetings.

Signature.....

Position or Title.....

**Firm*.....

Street No. .....

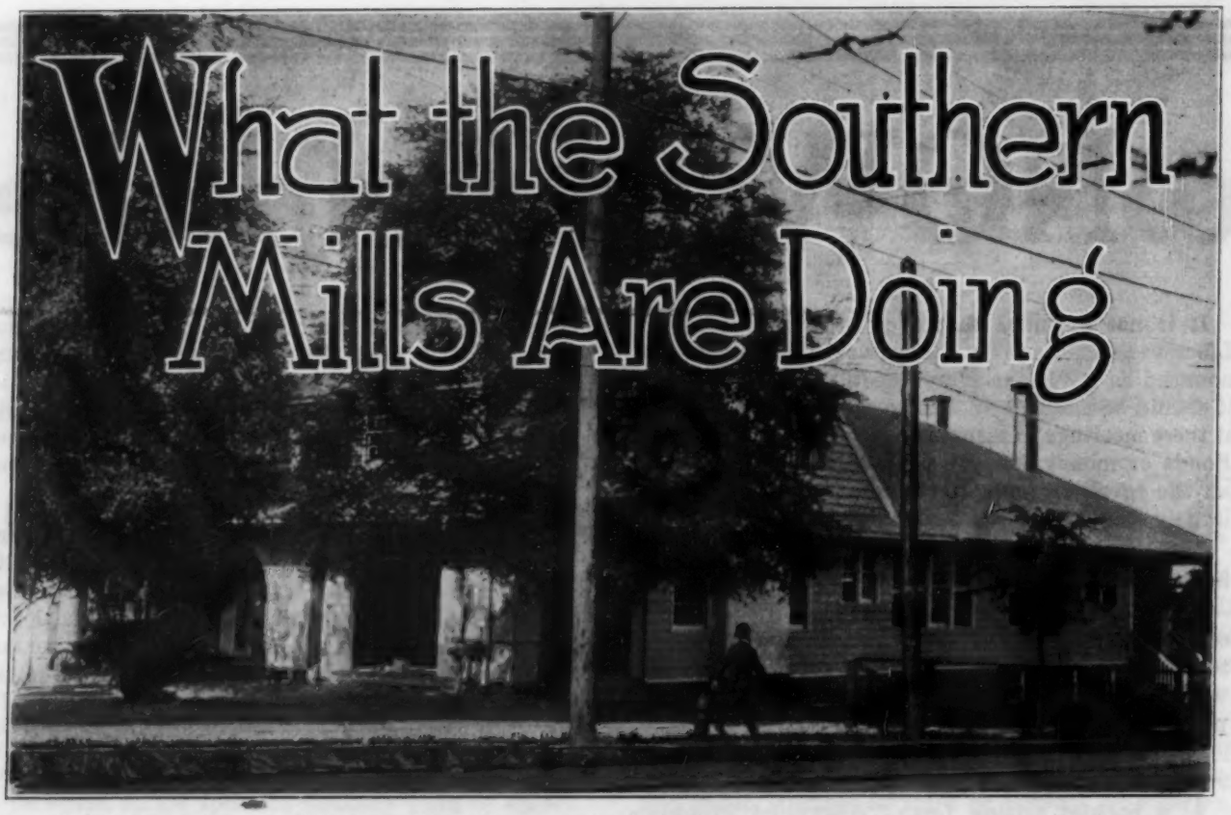
City .....

State.....

Date.....

*If a Society, Club or similar organization give name here.
†If more than one copy is desired state number.

What the Southern Mills Are Doing



A $30,000 INVESTMENT FOR WELFARE WORK INCLUDING DAY NURSERY, NOW BEING BUILT AND EQUIPPED BY THE EXPOSITION COTTON MILLS, ATLANTA, GA.

The Boston Evening Transcript recently asked editorially "With father at war and mother at work, what is to become of the children?" England answered the question three years ago by inducing its large employers of labor to establish day nurseries at their factories. In this country, the day nursery has been in operation for a still longer period at occasional points, but under the stress of war time conditions these buildings are becoming larger and more numerous.

The illustration at the top of this page shows one of these buildings under construction near the plant of the Exposition Cotton Mills at Atlanta, Ga. The California Cotton Mills Company has a very excellent building for this class of work which has been in operation for a considerable period, and which was illustrated and described in January 1918 number of COTTON.

While this method of caring for the children has been quite popular among southern mills, it is a comparatively recent addition to several New England mills. Two of the largest mills in Lawrence, Mass., the Washington and the Wood, have announced that they will make provision for taking care of the babies of the women who are engaged in the mills. Such buildings are equipped with playgrounds, sleeping porches, dining rooms, play rooms, competent nurses, etc.

In the South, it is the usual practice at these houses to receive the children in the morning as the parent goes to the mill, take the child into a receiving room where its clothes are removed and placed in a special locker. The child is then given a bath and dressed in a little suit of rompers and taken into one of the other rooms where it is well cared for until the time its mother calls for it on the way home.

It goes without saying that work of this character is not dictated by altruism alone. The companies operating these day nurseries make no such claim. On the other hand, it makes for better operatives and better humanity and the average cotton manufacturer, like every other human being alive, is doubly willing to do good for humanity if by so doing he can do some good for himself. The day nursery was always a convenience; to-day it is a war-time necessity. Women must work, both to support themselves and to help meet the current labor shortage, but they can not be efficient industrially unless they have assurance that their children are in safe hands while they are absent from home.

With daily capacity of 10,000 pounds, the Demopolis (Ala.) Fiber Co., will bleach linters for nitrating. This $20,000 company has a $12,000 equipment of machinery in a brick building of the Alabama Lumber & Supply Co., which supplies power.

The Absorbent Cotton Co. of America, which is located at Valley Park, Mo., is the new surgical dressing plant which we intimated in these columns some months ago as being under consideration. This plant, which will be in operation by the time this story reaches the reader is situated in a splendid location where there is plenty of pure air and pure water. It contains about 75,000 sq. ft. of floor space and is capable of producing absorbent cotton and other surgical dressings at the rate of about 8,000 pounds daily. The company is incorporated under the laws of Missouri with a capital stock of $200,000. Ralph McKittrick

is president and treasurer and Paul A. Schulz is vice-president and general manager. Incidentally, Mr. Schulz advises that he is in the market for a first class card grinder.

The Semple Manufacturing Co., of Louisville, which operates the Louisville girth and blanket plant, has decided to postpone improvements which have been under contemplation. The company had plans drawn and received bids for a large addition to its plant, this addition to have been of brick construction, three stories high, and for manufacturing cotton twines, cordage, etc. Alex Semple stated that after getting the figures it was decided to pass up the improvements until after the war, when building materials, labor and machinery would reach normal levels. However, some additional equipment will be installed, including Gordon-Hay attachments on the cards.

The death of President Norris of the Ohio Falls Dye & Finishing Works of Louisville, Ky., will cause no change in the management of the company. J. J. Brown is secretary-treasurer of the concern, and C. E. Martin is general manager. Both men have been with the concern for several years. Lee Rodman, now manager of the Indiana Cotton Mills, at Cannellton, was formerly connected with the management of the company.

An interesting article relative to the why and wherefore of the Louisville Cotton Mills recently appeared in the Louisville Courier, a paper which is running a series of interesting articles concerning early industries of the city. In this article it was stated that the plant was established in April of 1888, to manufacture cotton warps for use in manufacturing jeans which were then largely worn. A number of plants manufacturing jeans were in operation in Louisville in those days. S. S. Waters and W. C. Garland, of the mill supply house of Waters & Garland, which is still in operation, had been supplying warps from a plant for finishing yarns for that purpose, buying from various mills throughout the South. It occurred to these men that the warps could as well be made locally. Due to the interest shown by these men the Louisville Cotton Mills was established. The first mill was on Goss avenue, and employed 100 persons, with a payroll of $1,000 weekly, as against 360 people, at a cost of $5,000 weekly at this time. Not one of the five woolen mills manufacturing jeans in Louisville is in existence today. With the improvements in textile manufacture jeans were discarded for other materials, and the product of the local mill was converted into yarns for hosiery and knit goods.

The concern was originally founded by prominent business men of Louisville, including J. B. Speed, A. Robinson, Charles F. Johnson, S. S. Waters, George Gaulbert, J. W. Stine, John J. Barret, R. L. Whitney, and J. W. Henning, this list including bankers, cotton brokers, manufacturers, insurance men, and other large operators.

Today the officers are Philip S. Tuley, president; Tom S. Tuley, secretary; and C. N. Poore, superintendent. Both Phil and Tom Tuley have been very active in the business life of the city, and in the various trade organizations. At the present time Philip S. Tuley is director of the Louisville Industrial Foundation; chairman of the Jefferson County Fuel Administration; director and vice-president of the Kentucky Wagon Mfg. Co.; vice-president of the Middle States Textile Manufacturers Association; and president of the Kentucky Manufacturers' & Shippers' Association.

J. G. Ellis, of the American Woolen Mills, reports that he is good and busy on Government orders at the present time, manufacturing woolen yarns for sweaters and socks, sweaters for navy use, and socks for the army. Some months ago plans were underway for an immense addition to the plant, but local officials killed the deal, by first granting certain taxation and other concessions, and then withdrawing them, with the result, that the company decided not to build in Louisville.

A considerable amount of the better grades of Eastern Kentucky coal from the Harlan district are now being shipped into the cotton oil and textile mill districts of North and South Carolina, much of the coal from the Clinchfield district having been apportioned to other zones, and reductions made in tariffs whereby the Harlan coal could go into the Carolines on a better basis.

A 280 x 75-foot mill construction building will be erected by the Hickory (N. C.) Spinning Co. for its additional mill recently reported. Five thousand spindles and accompanying machinery will be installed.

The Ida Yarn Mill at Laurel Hill, N. C., are overhauling and refinishing and changing all their mill houses, painting inside and out; also putting up street lights.

The Hoskins mill of the Chadwick-Hoskins Company at Charlotte, N. C., are recovering and repainting all the operatives houses in its village.

The Martella Cotton Manufacturing Company has been incorporated at Eufaula, Alabama, with a capital stock of $100,000 by H. A. White, A. C. Havens and others.

It is reported that the Fidelity Manufacturing Company at Charlotte, N. C., is to build an addition for more machinery in the near future.

The Statesville (N. C.) Cotton Mills have recently refinished and enlarged the operative's houses in its mill village, put in street lights and piped artesian water from a deep well to the mills and village.

A piece of land of approximately 500 acres, located near Fort Mill, S. C., has been purchased by Hamilton Carhartt of the Hamilton Carhartt Mills of Rock Hill, S. C. Nothing has been given out to the public concerning the intent of this purchase, but it is assumed that it will mean one more manufacturing plant for South Carolina.

The Corsicana Cotton Mills are installing considerable new machinery in the card room and other parts of the mill. This mill is also installing new cement side walks in the mill yard and village and doing a great amount of other village improvement work such as grading the streets, etc.

It is reported that the Orr Mills at Anderson, S. C., and the Chiquola Mills at Honeapath, S. C., which mills are under the same control, are to have considerable improvements around the villages. Lights, water and sewage connections will be installed at the mills and in the operative's houses in the villages.

Every time you stick a Thrift or War Savings Stamp on your card you are mailing money to yourself to be received later with interest. Cashing in these stamps is going to be better than "getting money from home," for with the money comes the reminder that you contributed to the great victory which then will have been completely won.

New England Mill Situation.

Price fixing on cotton goods has progressed far enough to insure cotton mills a satisfactory margin of profit for some time to come. The basis on which the first prices were fixed was 30 cents a pound for cotton. At this writing, with cotton at 35 cents, it is certain to count upon no lower prices for the 90 day period beginning on October 1.

The liberal policy followed by the Price Fixing Board in the levels of sales values determined on has been prompted first by the desire to insure a full production, and again because it is proposed to give the mills opportunities to make large profits that will in turn be collected by the Government to aid in winning the war. It is manifestly easier to collect taxes from corporations in the form of excess profits than to go on trying to collect from the individual or the merchant.

In New England price fixing by the Government is no more of a popular policy in business than it is elsewhere. But the point has been made by New England manufacturers that control of speculation now will help the after war adjustment of values downward, and will tend to prevent many losses. Thus far the great advantage of price fixing has been to stabilize prices. The reductions that will be felt in the retail trade will not be very large.

This fact was emphasized during the month in a trade circular sent out by a western dry goods jobbing house. Customers were told that there was little reason to look for much lower prices than retailers had been working on and there were some reasons for anticipating still higher prices as the added costs of production were passed on to consumers. This circular offered some goods to the trade at prices slightly lower than the parity of Government fixed prices and lower than mills would undertake to supply goods for civilians on new orders. Nevertheless, the circular was timely in pointing out the true situation in the trade.

The handsome profits that have been made by the New England cotton mills are paralleled in the profits made elsewhere. Stockholders have not been allowed to participate in all the fine earnings as many mill managers have paid off their debts and have tried to build up their reserve funds to meet any war shock that may come. The character of the earnings may be inferred from the list of dividends paid to stockholders in Fall River mills for the third quarter of the fiscal year.

Thirty-three out of 37 corporations in that city paid a larger dividend last quarter than in the preceding one. The actual total paid for the quarter was larger than was paid by the same corporations in the whole of the years 1915, 1914, 1912 and 1911, or an average of 6.196 per cent. This was $800,000 larger than any total ever paid in a single quarter by Fall River cotton mills. It is not expected that any such total will be duplicated again and it marks the high tide of war conditions.

Other cotton goods enterprises in that city, not included in the list of corporations referred to, include the American Printing Company and the Fall River Iron Works mills, the large Durfee mills, the Standard Fabric company, engaged on narrow fabrics, several of the large yarn and thread companies, and two or three concerns making absorbent cotton goods and surgical dressings. All of these concerns have been making very large profits.

In the neighboring city of New Bedford the dividends were not quite so large but they are on a very high level, while all the northern New England and Rhode Island corporations have been making more money than ever before. Of the earnings, a very substantial percentage will go back to the Government in excess profits and the operatives will continue to receive the highest wages ever earned by cotton mill operatives in the history of the business. Naturally, these are war conditions and reaction from them is inevitable.

Cotton manufacturers here are not attempting to minimize the remarkable prosperity of the time. Those of them who are long experienced, however, are pointing out some facts that are to be reckoned with in the future operation of the pants. The machinery concerns are so busy that they cannot take on new business unless it is some way connected with war work. They are not running to their capacity owing to the difficulty of holding or securing skilled mechanics, and from time to time they are being restricted to actual work when draft boards look over their rolls and come to deal with their employees.

The costs of machinery have advanced to such an extent that mills are not warranted in making plans or additions even if it were possible to do any building not connected with Government purposes. But the machinery that is installed is wearing out and replacement will be necessary earlier than usual because of the unusual strain that is being put upon everything. The machinery men are so busy with various forms of war work, designing new machines for making cloths for special uses that they cannot give time to thinking out new devices as they would in normal times. It may be that later on, as the war continues and the first rush of furnishing supplies is over, more attention can be given to the preparation for after-war conditions. For the time being however, that is in abevance, and it is a point that every manufacturer must have in mind who regards the condition of his manufacturing plant as vital to long maintained profits.

Another matter that has been given much attention is the probable course of trade immediately following an armistice. Some manufacturers look for cancellations and a general business shock. In that time they believe they will have an opportunity to prepare for fuure developments. Others think that at that moment everything should be ready to turn machinery on to goods that will be wanted abroad and will be purchased from stock if manufacturers have courage to go ahead making them for stock.

The course of business since the early part of June when price fixing was announced as a policy to be pursued in cotton goods by the Government has been decidedly contrary to many expectations. Orders have not come in so freely yet the mills have gone on manufacturing just as actively as ever. The jobbing and retail trades have steadily contracted the volume of their business yet the producers have gone on as if nothing had happened.

There are several reasons why this should be so. All of the mills were overloaded with orders. They had set orders aside, unfilled, because one department or another of the Government had come forward and asked for prompt shipment of the goods bought on contract. Civilian business had been set aside everywhere. This was not felt much because the jobbers and retailers had been buying for

months in anticipation of profits to come from the rise in values and not always because of the added large consumption of goods among their customers.

The shock of price fixing talk affected the speculators and the retailers and jobbers who had goods enough in hand or on order to meet their needs for a long time. It did not affect the mills in the same way. The mills have at all times been in a position where they could decline business and still keep their machinery active. That condition bids fair to continue right into November if no further business comes forward from civilians. Another phase of the situation is that the mills have not been turning out a capacity production because of labor scarcity and there has been no accumulation of goods despite the inactivity of buyers.

The great cause that explains the situation, of course, is the immense volume of Government business in cotton goods that has been forced upon the mills in the period from April to the present time. The manufacturers themselves have hardly realized to what an extent civilian output had been curtailed.

It is only within a month that some of the finishers of goods for the converting and jobbing trades began to call attention to the limited volume they were receiving from their regular customers that several manufacturers began to visualize the true condition. The Government has been supplying fully half the business of the mills. The export trade has not declined in any thing like the expected ratio. a fact shown by the very well maintained shipments in May. Wherever there has been a letting down of production it has affected the goods normally required by the civilian trade of the country. The only reason it has not been felt is that civilian customers had bought for months in anticipation of the scarcity that is only now beginning to show itself.

Customers of the large finishing companies say they are unable to get gray cloths as fast as they need them. They cannot send goods to be finished because they are not getting the goods. In many instances, they have large unfilled contracts with mills. In other cases they have goods held up on the railroads. As a rule, however, they find that the mills have set aside their orders, to be filled when the Government releases hundreds of looms taken over for special work, some of which is only now beginning to come forward.

The volume of fine cloth wanted by the Government is running into millions of yards. It is being used for air machines of many kinds. No one wants to talk of the details as it is understood that many things are being done in the way of aeroplane and balloon production which it was said could not be done, even in England. The calls for hospital gauze, for sheets and pillow cases, for domestic cotton goods of all kinds for equipping the hundreds of vessels that are being built, are only suggestive of many Government needs that are being met without much publicity. The manufacturers of New England are bent on winning the war in every sense, but it is only within three months that they have begun to grit their teeth to the work of helping in their own immediate business.

The Metals Disintegrating Company, Inc., announce the removal of their offices from 3 South William Street to 62 Broadway, New York, N. Y.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, August 20th, 1918.

The war and its attending circumstances has, as in all other sections of the world, brought a big change in general conditions to the South, for notwithstanding the curtailment in exports of cotton from the United States to Europe, which were only 4,215,000 bales last season vs. 5,533,000 season before last and 6,035,000 in season of 1915-16, the price of the staple advanced to the highest level attained in the New Orleans market since 1867, or since the closing days of the civil war, middling in the local market having sold at 34½ cents per pound last April, and is still at the comparatively high price of 30.25.

The average price of middling cotton in the New Orleans market last season was 28.86 cents per pound, against 18.41 cents season before last and 11.99 in the season of 1915-16, making the average commercial value per bale of lint cotton $147.39 vs. $94.82 season before last and $61.40 in season of 1915-16. The value of the lint crop the past season was $1,667,788,939 compared with $1,146,102,224 in 1916-17 and $765,700,560 in 1915-16. Including the value of the seed, a total value of $2,001,682,939 was realized, against $1,412,860,035 season before last and $958,200,000 in 1915-16.

Although the South carried over from last season to this season a large surplus of raw cotton, it was in a position to protect this surplus by reason of its strong financial position. As a matter of fact the Census Bureau reported the visible and invisible supply in the United States at the close of July to have been 3,230,000 bales compared with 2,390,000 at the close of July last year. But the South has confidence in the future, and is firmly convinced by reason of the growing man-power of the American army in Europe, and because of the unlimited resources of the United States in every particular, that it is only a question of time when the strong arm of America will bring the Huns to their knees, and that when the end of the conflict is in sight, cotton will advance to a higher level, perhaps to a much higher price than most people think is possible, as all European countries, including the neutrals, are virtually bare of stocks of cotton and cotton goods, and will have to look to America, the principal producer of the staple in the world, to provide their wants, most likely for several years after the war is over.

Aside from developments commercially that have come with the war, one of the main reasons for the high prices for cotton has been unfavorable climatic conditions for the growing of cotton in the southern states, although the presence of the weevil and absence of potash fertilizer are responsible in no small measure for the small crops the past several years, or since 1915, one year after the war started.

Texas, that great cotton producing state of the southwest, possessing about 12,000,000 acres in cotton, or about one-third of the cotton cultivated area of the entire cotton region of the South, has not been favored with a year of ample moisture since 1914; the annual rainfall there having been very light in 1915, less in the years of 1916 and 1917, with no improvement this year, as the total rainfall for Texas during July of this year was the smallest for

25 years. So far this month the precipitation in Texas is the lightest for many years past.

As if to make matters in the western half of the belt worse, Oklahoma this year is reported to be almost as bad off for want of rain as is Texas, while conditions in Arkansas and Louisiana are said to be not much better. Furthermore there was an unbroken spell, of very long duration, of high temperatures and excessive heat west of the Mississippi river, particularly in Texas, since the middle of June, which played havoc with the cotton crop. As yet the heat wave in the Southwest remains unbroken, and it is doubtful if generous rains at this late date would be of much benefit to the crop, except, perhaps, in the more southerly districts, where frost, as a rule, does not meterialize until very late in the year.

It is evident, therefore, that with the trade facing the probability of another short crop this year, which would be the fourth consecutive short yield, that the world is in for another season of high prices for cotton. Indications at present point to a smaller crop than last year west of the Mississippi river, but a larger yield than one year ago in the eastern half of the belt. In other words the present outlook is for a total crop not much larger than last year's 12,431,000 bales, which included 1,131,000 bales of linters, with the possibility of further deterioration in event of storms or an early killing frost.

A feature of interest in connection with linters is that the United States alone last season consumed 1,116,000 bales of linters out of a total production of 1,131,000 bales, due, no doubt, to the making of powder for war purposes. Of late the United States has doubled its powder making capacity by the construction of two great powder mills, one in Tennessee, the other in West Virginia.

If this year's crop proves to be not much larger than last year's short yield, there will hardly be enough linters for domestic consumption, making it possible for large quantities of low grades to be used as a substitute, thereby probably making a market for a character of cotton that was a drag on the market the past season.

Of course, if the war was to continue for more than another year, and if there should be no increase in tonnage to move cotton to Europe in a larger volume than was shipped last season, there would likely be enough cotton to go around this season, but if more ships are provided for exporting the staple, or if there should be indications for an early peace, the supply would hardly suffice for world requirements, except, perhaps, at higher prices eventually.

In the meanwhile erratic markets are to be expected, most likely violent fluctuations, but buying on important declines would seem to be advisable as the season progresses, as there is bound to be an end to hostilities, if not this year, most probably in 1919. Until that time people of means will carry cotton, if only a little, the aggregate of which will be much; this may make it difficult to buy, especially if the Allies continue to make the headway they are making now.

"No man is a cripple from choice, and because he is a cripple he should not be forced to remain dependent on friends or on society. Instead of giving a cripple charity, give him a chance to work.

The Yarn Market.

Undoubtedly the outstanding feature in the yarn market for the past month has been the question of maximum prices for yarns which were fixed by the War Industries Board. In the early part of the month everyone was expectant and in the latter part of the month all buyers were dissatisfied.

The prices as published by the War Industries Board were not at all favorably received by the buyers in the Philadelphia Market and the comments made at the regular monthly meeting of the Pennsylvania Knitters, as recorded elsewhere in this issue, undoubtedly indicates some of the feeling that has been aroused in that section.

Much to the surprise of many, the southern spinner of coarse and medium numbers of weaving yarn was not so well used by the price fixing committee as was his brother manufacturer making carded knitting yarns. It has not been made quite clear why this distinction was made, but that there is a distinction is quite evident to everyone.

The railroad situation has been relieved to a very considerable extent and stocks of yarn in the New York and Philadelphia markets has increased very materially. However, prices are maintained very close to the allowable maximum and from the standpoint of trading the market has been practically at a standstill since the new maximum prices were announced. Everyone seems to be waiting for the other fellow to move first.

No quotations are affixed to the review this month, for the reason that with asked prices practically at the maximum ruling and comparatively few sales, such quotations would be practically meaningless. However, all interested are watching the situation closely and awaiting developments.

Tenth Annual Outing.

About 450 employees of the Home Bleach and Dye Works enjoyed Saturday, August 3rd, at Rocky Point, where they participated in their 10th annual outing, five special cars bearing the operatives and their friends to the scene of their merrymaking. During the ride the committee distributed chocolates to the ladies and cigars to the men.

Arriving at the Point, the excursionists "hiked" to the ball park, where a group photograph was taken. An excellent programme of games and athletics followed.

The bleach house team proved superior over a team composed of the shop's choicest men in the tug-of-war, pulling them across the field for mere exercise after they had won the event. The married men captured the baseball game by the score of 3 to 1, much to the chagrin of the "unhitched" ones.

At 1 o'clock all employees gathered in the dining hall to enjoy one of Rocky Point's famous shore dinners. Afterwards the midway and dance hall furnished amusement enough to keep them from wishing for 6 o'clock, the hour for the return trip to begin. The employees arrived in this city about 8 o'clock, after spending a genuine "red letter" day.

Tact is one of the most elusive qualities in the world. Yet in business, as elsewhere, it is invaluable.—*Cottonyarns.*

COTTON MANUFACTURING.

Arizona Long Staple Cotton.

From two angles connected with the Government, the subject of long-staple cotton development in Arizona from Egyptian seed, is timely and of unusual interest. Perhaps first comes the fact that the "American-Egyptian" cotton (for so the Government now has elected to class it), is being used in the manufacture of airplane fabrics. Second, the development of this variety of staple has gone far enough for the Government to go to the work of prescribing standards for grade and length. In the main, however, the staple is associated with the manufacture of automobile tire fabrics.

Not much attention has been called to the first point, but that makes it none the less important. The difficulties in obtaining linen, heretofore the mainstay in the production of airplane fabrics, has led to a search for substitutes. It remained for J. Arthur Atwood, of Boston, treasurer of the Ponemah Mills, Taftville, Conn., to develop the first substitute for linen from the American-Egyptian cotton. This staple has proved to have great spirality and considerable utilization of it for airplanes for the Government is expected during the next twelve months, according to textile authorities in Boston.

It was a small despatch from Chandler, Ariz., to a Boston daily (The Transcript) which led the correspondent of COTTON to investigate the use of the cotton mentioned for airplane fabrics, with the result shown above. This item said that "another use for the long-staple cotton which is grown in the Salt River valley of Arizona has developed by an order which was recently received from Boston, Mass., for the immediate shipment of two hundred bales of the product to that city for manufacture into airplane fabrics. It is stated that experiments have shown that the long-staple variety grown around Chandler is specially suited for the manufacture of strong fabrics."

Recognition of the importance attained by the development of the cotton is found in a recent statement by the office of the information of the U. S. Department of Agriculture, which says:

"For some years past, a special type of Egyptian cotton has been produced commercially in certain of the irrigated sections of Arizona and Southwestern California. This type of cotton was formerly known as Arizona-Egyptian cotton, but will now be designated as American-Egyptian, because it is being grown in states other than Arizona. The present indications are that the commercial crop of this type of cotton for the season of 1918-1919 may aggregate 40,000 bales, or more."

In the consumption of this staple, New England has had virtually a monopoly to date. This will be seen from the fact that, of something like 13,000 bales grown in Arizona last year, 11,000 have come to mills in New England for consumption. Some of it has been used in fine goods, some for thread, a portion for airplane purposes, but the great bulk for automobile-tire fabrics. Practically all is in control of the Southwest Cotton Company, Phoenix, Ariz., a subsidiary of the Goodyear Tire and Rubber Company, of Akron, Ohio.

In fact the development of the long staple in the Salt River valley has been largely the project of the Akron Company. This concern, through the subsidiary company, has established large plantations for the raising of staple to make it independent in securing cotton for the production of the tires, in which it is so extensively engaged. The uncertainties of getting a supply elsewhere, in view of the conditions pertaining to Egyptian cotton and the limitations of output of Sea Island staple, show that the move was judicious indeed.

It is through another subsidiary, the Goodyear Cotton Mills, Inc., of Killingly, Conn., that the Akron company utilizes the American-Egyptian cotton. Incidentally the assistant treasurer of the Goodyear Mills, W. Irving Bullard, of Boston, makes the same estimates as the Government for the coming crop. This expansion will be largely the work of the Southwest Cotton Company.

Other mills of the New England textile district which utilizes the Arizona cotton include the Beaver Mills, North Adams, Mass., the Connecticut Mills Company, Danielson, Conn., the Jenckes Spinning Company, Pawtucket, R. I., and the Avon Mills Company, Lewiston, Me. A small portion of the crop has been absorbed in the fine-goods mills of New Bedford. Outside the district, a conspicuous user is the Trainor Spinning Company, of Chester, Pa.

Concerning the further use of American-Egyptian cotton, at the present much depends upon the extension of tire-fabric production. The amount of Egyptian cotton which will be available is another factor. It is estimated that a total of 25,000,000 tires will be made this year. The cotton required for this production is figured to approximate 220,000 bales. Various grades of cotton are used in the process, the proportion of first-class staple being around thirty per cent. The Arizona staple comes in this class. Roughly estimated, 65,000 bales of the best cotton will be needed for tire fabrics alone.

In the natural course of events, the production of tires for automobiles would increase next year. This may not happen, because the war is upsetting things so extensively. However, the new factor of cotton in airplanes may prove to be important in the use of Arizona staple. Then there is the uncertainty of getting Egyptian cotton; in fact the size of the crop and the scarcity of tonnage in addition to British Government control make the outlook dubious. Hence it is reasonable to expect a demand for the Arizona staple in excess of the outturn, so that the expansion of the crop this year to more than double the size of 1917 may be reckoned as a mere beginning of a very extensive development in the southwestern field.

It is claimed that this cotton has the greatest spirality of any now grown. Peruvian cotton, also used in the manufacture of tire fabrics, is said to stand second in this quality. Arizona cotton is the most scientific agricultural development by irrigation in the world, says Mr. Bullard. The cotton is necessarily expensive, under the circumstances,

but the tire-fabric producers at least find it practicable to use the staple. A feature of the cultivation is that the boll weevil cannot ravage the territory in which it is grown. This is because the arid lands between Mexico and the Salt River valley prevent its migration to the cotton fields.

This spring Mr. Bullard communicated with the Southwest Cotton Company to ascertain the situation in regard to production, average length of staple and similar points. The statement from Washington referred to, also said that "the Department of Agriculture has been co-operating with the growers in developing this new industry. One of the features of this co-operative work has been the standardization of the commercial product.

"Investigations made in connection with this standardization work have shown that it is practicable to cover the range of grade qualities of this cotton with five grade standards." Mr. Bullard's inquiry as to the grades brought the reply, "fancy, extra, choice, standard, medium." The Government's grade standards are announced as No. 1, or Fancy; No. 2, or Extra; No. 3, or Choice; No. 4, or Standard; No. 5, or Medium."

As to average length of staple, Mr. Bullard was informed that it is 1¼ to 1⅝. The Government statement says "preparations are now being made to promulgate officially these five grades of American-Egyptian cotton and also standards for staple lengths. The standards for length will show three staple lengths, which will be known as 1¼, 1⅝ and 1¾. Only the first two will be available for distribution at this time. These standards will be expressed in cotton of the variety known as Pima, which is the variety being planted almost exclusively the season of 1918." This variety and the methods used in its cultivation were illustrated and described very fully in the January, 1918, number of COTTON.

Other points investigated by Mr. Bullard are the average output per acre, in bales, the size of private holdings, the interest of farmers and the methods used in marketing by small holders. The average production was stated as ½ bale per acre. The private holdings run from 40 to 1,000 acres and the farmers are reported to be interested in the production. Nearly all the small holders are financed by the gins and their cotton is bought through the buyers from the gins.

In conclusion, the Government statement says that "suitable material has been collected and purchased for making up these standards of grade and length and copies of the standards will be ready for sale before the marketing season of 1918-1919 opens. The price of the copies will be $5 for each grade box and $25 for the full set of five grades, and samples of the length standards will be offered for sale at $1 each. Any parties contemplating the purchase of a set of copies of these standards can secure the desired information by addressing Charles J. Brand, Chief, Bureau of Markets, Department of Agriculture, Washington, D. C."

In a brochure on "The Quest of the Long Staple Cotton" published last year by the Merchants National Bank of Boston, the opening sentence calls such cotton the "golden fleece" of the textile industry. The introduction goes on to say that "the uses of Egyptian and Sea Island long staple cottons have expanded entirely out of proportion to the production, so that it is a generally recognized fact that either the acreage planted must be greatly increased, or substitutes must be used. Factors contributing to the increased uses of these staples are the manufacture of automobile tire and top fabrics, the changing styles in dress fabrics, the substitution of mercerized yarns for silk, and the constantly expanding market for threads and yarns for insulating purposes made largely from the long staple Sea Island and Egyptian cottons." The brochure is the work of Mr. Bullard, who is manager of the industrial service department of the bank.

This brochure contains the following information on the Arizona long staple:

"In 1913 the members of the Southwestern Cotton Committee of the U. S. Department of Agriculture met with the members of the Arkwright Club of Boston and by presenting samples of the various types called the attention of cotton dealers to the new long staple crop of Arizona. From then on the demands for Arizona-Egyptian cotton increased, and to meet the needs of the manufacturers, irrigation plans were rushed and the acreage available for planting was developed.

"The following table will give the results of the Egyptian plantings to date in the Salt River Valley:

Year.	Production in Bales.
1912	220
1913	1500
1914	6300
1915	1000
1916	4000
1917	Estimated 9000

"The future of the Southwest is bright and it has already won an enviable reputation in the cotton world. The rich soil, abundant sunshine, plentiful water supply, and a long growing season, offer unlimited opportunities for the production of long staple cotton."

Cotton Manufacturing in India.

The piece goods trade with India amounts to between 85 and 90 million dollars annually. This in spite of the fact that there are a comparatively large number of local mills, aggregating something over six million spindles. However, the production efficiency is very low and the type of operatives very inferior, as may be noted from the following article recently published in *The Indian Textile Journal*, of Bombay

"When the cotton trade was bad in Bombay and millowners were advised to provide better dwellings for their coolies, they said that they had no money for the purpose. When trade improved they were recovering their losses of the bad times and still had no money to spare—at least they said so. It is said that Bombay city has rules against overcrowding, but they are a dead letter because for many years there have not been houses enough to lodge the coolie population. The beginning of the Improvement Trust activity was the beginning of a period of extreme shortage of dwellings, and the habit of overcrowding, once acquired, has become a custom that has had very regrettable consequences not only to the coolies but to the spinning and weaving trades in the island.

The mill coolies belong to the agricultural class, and many of them leave annually for a period of work on the land. This is good for their health, but bad for their skill as spinners. In the village there is air and there is space, rents are low, and overcrowding is unnecessary; sanitation receives scant attention, but so long as plague or cholera does not visit the village the general health is good.

"In the coolie quarters of Bombay the conditions are vastly different, and even where good houses have been provided the habit of overcrowding to reduce rent has destroyed the benefits that should result from better quarters. Along with this a taste has grown up for excluding light and air from their dwellings that defeats the best efforts of the architect to give them sanitary homes. Demoralization takes place within the mills in another manner. It is due to defective ventilation combined with excessive moistening that is carried out under the impression that manufacturing is facilitated thereby. Very careful experiments made by W. Thomson, F.C.S., of Manchester, proved that any amount of moisture in excess of 8.93 per cent in the cotton fibre offered no advantage, and that no benefit to manufacture arises from temperatures in excess of 85° Fah. or from atmospheric humidity greater than 65 per cent. It is not always possible to obtain such conditions in India, but the nearer they can be approached the better for the efficiency of the Indian worker who, on a careful estimate, is valued on a working basis at only 37.5 per cent of an English millhand. What the Indian might become under favorable conditions has still to be ascertained. In the evidence furnished by Sir H. F. Smith to the Factory Labor Commission of 1906 was a list containing the working conditions of 47 English cotton mills. In one of these, counts of 100 to 160 were being spun in a temperature of 83° Fah. with humidity at 57 per cent, while in another mill 210's counts were spun at a temperature of 91 degrees F. with humidity at 44 per cent. These conditions are of course impossible in India except on rare occasions, but they prove that excessive moisture is not necessary, and the above-mentioned list is in harmony with the English Act that came into force on April 1st, 1912, recommending 75 degrees as the limit on the wet bulb hygrometer.

"The human body produces much more heat than is necessary to maintain life, and if this surplus does not escape readily there is an immediate reduction of bodily and mental vigor and, naturally, of working efficiency. When the temperature of a Bombay ring spinning room rose to 105 degrees F. on the 28th of December, 1906, while the outdoor shade temperature was only 81°, conditions were manifest that were prejudicial both to the interests of the manufacturer and the efficiency of the worker. An outside temperature of 81° is not a bracing one, and the workman on leaving that ring room to go home had certainly a lowered vitality that usually predisposes to drink. Indian laborers are used to a hotter climate than the English millhands, but their blood temperature must remain the same, and they are just as sensible to increases beyond the normal air temperatures as are the English mill operatives.

"It is the interest as well as the duty of a factory owner to endeavor to keep his employees healthy and active, but there is little sign of this in Bombay. Bad ventilation and overcrowding combined have fostered habits among the work-people that are not only prejudicial in every way but will be found exceedingly difficult to correct, for any interference will certainly be resented by a community that is suspicious and easily provoked, ignorant and obstinate. In reviewing the situation we have to consider a class of people who have been drawn from agricultural life by the attraction of increased wages to a new kind of life in a crowded city which is neither good for health nor morals. It does not even develop working efficiency and it is cursed with a system of hiring labor by contractors that is equally bad for employers and employed. Large fortunes have been and are being made by the cotton mill trade, but while welfare work is growing in popularity in England and the United States we hear nothing of it in Bombay.

"The mill laborer of today is the outcome of the mill industry, and he represents a decadent class. The questions arise: How far is the millowner responsible for the social state of the mill coolie? Is any man to continue to be allowed to become a large employer of labor without any industrial education at all and delegate his responsibilities to hired assistants? India is the only country where the millowner deliberately ignores all industrial training and contents himself with such experience as he can get in an office. This course has succeeded so far; but how about future competitions with rivals who neglect no branch of training that can conduce to success in cotton manufacture? The manufacture of white lead and phosphor matches has long since been put under strict control in Britain on account of the injurious influence on the workpeople, and more recently the Factory Act has put the atmosphere of cotton mills under the supervision of duly appointed inspectors, and it is found to work satisfactorily. The time seems now to have arrived for a corresponding control in Indian mills, not copied from the English Act but based on local conditions and requirements. This seems all the more desirable as, from evidence that can be furnished by a few enlightened mill agents, ventilation properly applied is not only wholesome but commercially profitable.

"Bombay, owing to land speculation and other causes, has become too dear a place for a laboring population of about 750,000 that will not raise their wage value by improved methods of work. They even resent any attempt to help them in this direction stating that it would mean a reduction of employment. These are the people who struck against an attempt to change their hours of labor from local to standard time, having been persuaded by certain demagogues that it was an attemtpt to cheat them of a porion of their wages! The time has come for the building of cotton mills on the mainland where land and living are cheap. This change has taken place in Manchester during the past 50 years, until at present only two or three fine spinning mills remain in the city. Rates and taxes rose in Manchester until everyone who could afford it lived outside municipal limits, and the mill population began to drift away. When new mills begin to be built on the mainland their economies will suffice to continue the migration of the industry away from Bombay."

"Every industry should take its share of the cripples in the community. The employer of labor who has no cripples in his shop, store or office, is not only failing his duty toward his unfortunate fellow men, but is wanting in patriotism."

Dyeing, Bleaching and Finishing.

Dyehouse Troubles.

BY A. F. MUSGRAVE.

It is always interesting to the dyer who is seeking to increase his stock of dyehouse lore, to read of the troubles of others and the manner in which the troubles were overcome. The writer for many years worked as a demonstrator and was therefore frequently called to remedy all sorts of trouble, some of which, to tell the truth, were more or less imaginary on the part of the mill people. Most of the difficulties were caused by local conditions which were absolutely all wrong and which would have been noticed by the dyer if they were taking place in some one's else establishment, but long familiarity with the conditions in his own place had put him into a sort of a rut. As a general thing most dyers and mill men, when troubles develop, are almost too ready to lay the blame on the dyestuff and the concern from whom the color was purchased. This is no doubt human nature to try and convince yourself that the other fellow is at fault but in the majority of cases where trouble develops in the dyehouse it is the fault of the dyer or due to some peculiar local condition which necessitates a changed process in order to produce the best results.

Probably every dyer will agree that the production of level and otherwise satisfactory colors on cotton is simpler than the dyeing of wool although as cotton colors do not exhaust to the same degree as wool colors, the dyeings are probably more susceptible to slight changes in the temperature and concentration of the dyebath. Every woolen dyer knows that different grades of wool will dye up very differently while with different grades of cotton the difference is much less. The dyeing of the fast cotton colors such as the sulphur and vat groups, however, probably offer more difficulties than the dyeing of the afterchrome colors on wool fibre. The bleaching of cotton fibre is a much more complicated process than the bleaching of wool and it is a very easy matter to cause great damage to the goods by some slight slip-up, either in the boiling out, chemicking or washing.

In the bleaching of cotton material the most important thing to be on the lookout for is, of course, tendered goods. It is also a matter of extreme importance that knitted fabrics, especially those produced for wearing apparel, be bleached in such a manner that they retain as far as possible all the softness and elasticity for which such fabrics are prized. The dyer should also remember that if he is going to dye the goods after bleaching that it is not necessary to give as hard a bleach as would be required were they to be sold as white. Investigations which have been made to ascertain the cause of certain bleached fabrics developing a pronounced yellow tone on storing, tend to show that the trouble is due to poor bleaching in that the waxy matters of the fibre were imperfectly removed or that the agents used for bleaching were not properly removed from the goods after bleaching.

If the goods are boiled out in a kier it is necessary in order to assure an even boil that they are evenly packed, as uneven packing causes channels to form with consequent uneven distribution of the lye. Even if the kier has been well packed the goods have been known to become partly turned over if the steam is turned on too rapidly. It is of course necessary to see that all the air is expelled from the kier before the operation is commenced, it being a well known fact that the oxygen of the air in conjunction with boiling alkalies has a great tendency to form oxy-cellulose. It is generally conceded that the boiling out process is the most important part of the whole bleaching process.

In the chemicking process it is of course necessary to see that the hypochlorite solution contains no undissolved particles of lime which would become affixed to the cloth and produce tendering at that point. Most bleachers in the past have relied on the hydrometer as a means of testing the strength of the bleaching bath, but at the present day the up to date ones make a test for the percentage of available chlorine which is present. The use of liquid or gaseous chlorine will of course tend to prevent the cloth becoming damaged by the presence of insoluble particles of lime. It is also admitted that the use of these products produces a better bleach with less danger of tendering than where the old chloride of lime is used. By the use of these products it is also easier to control the strength of the bleaching baths so that the results will be more uniform.

After the chemic, there is the question of the proper sour or antichlor to be used and the use to which the goods will be put will decide what method of removing the excess chlorine should be used. Where the goods are to be sold as white and it is not desired to produce a soft feeling fabric it is usual to remove the excess chlorine in a bath of dilute sulphuric acid commonly called a sour bath. When sulphuric acid is used for souring any hypochlorite left in the fabric will become changed to calcium sulphate, which being insoluble, does not wash out and thus tends to make the fabric harsh. Where softness is a desirable factor the best results are secured by souring with a solution of hydrochloric acid, the products formed in this case being the soluble calcium chloride which is easily washed out of the goods. It is necessary however when using hydrochloric acid to select a grade which contains no iron as some grades contain sufficient iron to yellow the white. Where the bleached goods are to be dyed it is also advisable to use hydrochloric acid in order that there shall be no calcium sulphate on the fibre to act either as a resist or a mordant, depending on the kind of color used for dyeing. Whatever kind of acid is used, it is necessary that it be well washed out of the fabric before the goods are dried in order to prevent damage, while if hypo or bisulphite is used instead of acid, there will be no danger of tendering due to insufficient rinsing. It has been found that after the souring or anti-chlor bath that the goods will dye more evenly if they are given a quick boil with a little soda. This treatment of course tends to remove any acid or other substances which might have been left in the cloth and which might cause unevenness in dyeing.

The manufacturers of hosiery sometimes have difficulty in bleaching the hose so that the double heel and toe

is a good white but this can easily be done if the chemic solution is made somewhat weaker than usual and the operation prolonged so as to give the double parts of the hose sufficient time to become bleached. Another difficulty which every bleacher has to contend with is the presence of oil spots due to faulty lubrication of machinery or other causes. In general fresh mineral oil spots are removed in the bleaching process but old spots are almost impossible to remove. The remedy for this is to use for lubrication wherever possible an oil, of the vegetable class, which will be easily saponified and removed during bleaching.

In the dyeing of bleached goods it is a very difficult matter to keep the shade of the various batches uniform, this being due to the fact that it is practically impossible to bleach two lots of cloth to the same degree of whiteness and while the slight difference cannot be noted in the white goods it can be easily seen if rolls from two different bleachings are dyed in the same bath. It is not only in the different batches that uneven results are noted but where dyeing bleached knit goods in light shades, the different rolls are apt to be a different color. The cause of this fault is probably due to an uneven distribution of chemic or temperature in the bleaching machine so that some rolls are more affected than others. The real remedy for the dyer who is dyeing egyptians or other light shades over a bleached bottom and having trouble of this character is to adopt the Autogyp process wherein the goods are bleached and dyed in the same bath and if the various chemicals are accurately weighed up every batch will become bleached and dyed to the same degree.

In order to illustrate to what extent one class of goods may cause trouble to another class the following incident is given. A small mill manufacturing cotton knit goods was dyeing bleached egyptians, white, sky blue and occasionally a red. This red was dyed with Benzopurpurin, 4B in about a 2 per cent strength. This mill had only a limited drying capacity, their equipment consisting of four vertical pipes on which all bleached and dyed goods must be dried. One day it happened that a batch of red arrived at the dry room just as the last of a lot of bleach was being run off and while the dry room man could see the necessity of washing the pipes immediately preceding the running of bleach he saw no reason for washing after bleach and before red. The red was accordingly dried and then turned and sent to the cutting room where it was found to be full of blue spots. The dyer was immediately called to the cutting room and as it happened to be a new shipment of dyestuff he stated that the color must be wrong. The reader by this time has no doubt guessed that a small amount of acid remained on the pipes from the bleached goods and that this small amount of acid was sufficient to turn the red blue in places. This was just what the trouble was and a small piece of the red cloth when pressed against some of the wet bleached cloth became blue. The rolls were of course easily fixed up by running in an alkaline bath for a few minutes. The dyer was advised to rinse his bleached goods a little better and also to add a small amount of soda ash to his red rinsing bath.

This same mill also had trouble with marks from the copper basket of the extractors these showing up especially on their tan shades. In this case the trouble was that one or more of the dyes was very sensitive to copper, probably Chrysamine or a similar color. Rather than change to a new combination of dyes with the usual troubles of such a change it was found to be sufficient to have the basket of the extractor tinned on the inside.

The writer once had occasion to go to a mill which was trying to dye an egyptian over a bleached bottom and using a stock which was more or less contaminated with yellow and blue specks. The blue specks were destroyed during the bleaching process but the yellow stains or rather specks resisted the action of the chloride of lime. The trouble was gotten over in this case by replacing the caustic boil with a hydrosulphite discharge and then chemicking in the usual manner. This process not only resulted in a beautifully clean fabric but it was also found that the shrinkage was much less. It was necessary in this case to somewhat prolong the bleaching action as the motes seemed to be acted on very slowly by the chloride of lime.

In the dyeing of developed colors there are several factors which will cause trouble, one of these being the effect of sunlight on the partially finished goods. Take the well-known color Primuline for instance, which is a yellow when dyed direct and which becomes more on the orange cast when placed in the diazo bath. If the material, while in the diazo solution, is struck by a ray of strong sunlight the color is decomposed although it cannot be noticed at that time. Now when the material is rinsed and worked in the developing bath the red color will develop except where the sunlight has acted, these places remaining the orange color. When Primuline has been affected in this manner it seems to be impossible to strip and redye so that the goods will be satisfactory. Practically all of the developed dyes show this same sensitiveness to the action of light, but on the blacks the difference cannot be noted so readily.

In the dyeing of developed blacks it is sometimes found that a batch comes out very brownish and this is caused by the fact that the developing bath is not in an alkaline condition and that the goods still contain some nitrite and acid from the diazo bath. The nitrite and acid combine with the meta phenylene diamine to form a brown dyestuff which deposits on the material thus giving it a brownish cast. If the developing bath is kept alkaline and the goods given a good rinse from the diazo bath this condition cannot occur. The well known developed dye Diazo Black BHN is a blue before diazotizing and developing while most of the other blacks are rather greenish blacks in the direct dyeings. On account of this fact many dyers who dye developed black on hosiery prefer the dyes which in direct dyeings are greenish black rather than the one which gives a blue bottom. The explanation for this choice is as follows. Sometimes if the goods are not thoroughly worked in the diazo and developing bath, all parts of the material do not become developed and as a consequence small places may be left blue or greenish black depending on what dyestuff was used and as the greenish black color can hardly be noted it does not require redyeing as would be the case were the blue bottom color used.

In the diazotizing bath it is possible to use either sulphuric or hydrochloric acid there being no difference as far as the actual shade produced is concerned. Where only copper machines are available for this work it is much better to use sulphuric acid as the use of hydrochloric under these conditions sometimes results in stains. When preparing the diazo bath, first dissolve the nitrite and add to the cold bath and then add the acid while stirring. While a beginner

the writer added the acid to the nitrite in a small pail with the result that the entire dyehouse force was driven outside by the extremely penetrating poisonous gas which is produced under these conditions. An amusing incident happened some years ago in a mill which was just starting to dye Primuline. The process was carried out exactly as outlined by the dyestuff house but the result was not a red but a yellow. On investigation it was found that the mill man, not being a student of chemistry and therefore not realizing the great difference between an "a" and an "i," had ordered *nitrate* of soda instead of *nitrite*.

It is remarkable that so little trouble is met with in the dyeing of the sulphur dyes as they are rather a hard group of dyes to handle in such a way as to produce the best results. The chief necessity in the application of the sulphur dyes is that they be in a well dissolved condition. This may take equal or double the amount of sulphide of soda as color, it all depending on the particular dye which is being used. An excess tends to prevent the color from being exhausted while a deficiency also results in weak dyeings due to the fact that the dye is not all dissolved. The amount of soda may be varied within wide limits without any harm occuring, on blacks an excess tends to produce greener shades. Certain dyers have claimed that they use the sulphide crystals rather than the concentrated sulphide as they get cleaner results and there is less sediment in the dyebath. Whichever is used it is well to remember that the concentrated is twice the strength of the crystals. Sulphide in whatever form should be stored carefully as it easily oxidizes with a consequent loss in strength. The proper amount of salt to use is rather hard for the beginner to regulate, as there is always a tendency to add too much salt, an excess of which gradually accumulates in the standing bath. After the first three batches the addition of salt should be controlled by the hydrometer and the reading should be at 13½° Tw. This of course refers to black and to the cold liquor. A boiling liquor will show a much lower densitity. By the use of excessive amounts of salt the dyeings are apt to crock badly as the dye is all precipitated on the outside of the material. It is a simple matter to remove an excess of dye from a sulphur dyed fabric by boiling in a fresh bath containing sulphide and a little soda ash.

The temperature at which the dyeing is carried out has also a great deal to do with the results, it generally being found that the lower the temperature the fewer the streaks or bronzy places. It is of course necessary to prolong the dyeing operation and increase the percentage of color where the temperature is diminished. One dyer who was noted for the excellence of his sulphur dyed black yarn always dyed at about 160° F. This same dyer was also a believer in the crystal sulphide rather than the concentrated kind.

In dyeing warps in a dark shade it means that the dye liquors must be very concentrated owing to the fact that the material is in the liquor for such a short time. Where a large amount of sulphide of soda is in the bath and the warps are given a large number of runs it seems that a certain amount of tendering takes place. Frequently goods which have been dyed with sulphur colors have become tendered after they have been in storage for some months but this has always been found to be due to the formation of small amounts of sulphuric acid which is produced either by the oxidation of the color itself or by the oxidation of free sulphur contained in the dyestuff. The remedy for any after effect like this is to make the final treatment an alkaline one so that the fibre will contain a sufficient amount of alkali to neutralize the sulphuric acid which might be formed. This after-treatment is also of value for stock as it tends to reduce the danger of fires in the dryer. It has been shown by certain investigators that an after-treatment with bluestone tends to facilitate the after-formation of free sulphuric acid, while a treatment with chrome or with a mixture of the two has no such action.

When uneven results are secured in the dyeing of yarn, pieces, or hosiery the trouble is due to one or more of the following causes.

Poor preparation of stock.
Poor quality of dyes.
Poor manipulation.
Poor mechanical equipment.

By the poor preparation of stock is meant, poor bleaching or souring, poor wetting out and the presence of starch in piece goods. It is easy to see that if the cloth is unevenly bleached or not properly soured that it will be almost impossible to produce even dyeings in light shades. The same will also hold true where the material is not properly wetted out. Goods which are heavily sized are subjected to the malting process before dyeing, as otherwise it is difficult to secure level dyeings. The writer once called at a mill which was dyeing a direct olive on raw cotton in a Klauder-Weldon machine. They complained that the dye left white particles of cotton undyed while the rest of the batch was evenly colored. On investigation it was found that the cotton was taken direct from the bale and was not run through a bale opener but packed directly into the machine with the result that the cotton in the interior was not properly wet out. Their procedure was to boil out the cotton in plain water for ten minutes, then run off halfway, fill up and dye. The addition of a small amount of Puroline wetted out the cotton satisfactorily by just bringing to the boil and then letting half off as before.

In the dyeing of mercerized yarns and fabrics it is very important that the mercerizing has been evenly done and that the caustic has all been thoroughly rinsed and neutralized. In the dyeing of hosiery which is singed before the dyeing care must be taken that the singeing is not too severe or dark marks will show up through light colors. On silk and cotton hosiery it is necessary that the material be well boiled out in order to remove the silk gum.

By the quality of dyes is meant that property which they have of dyeing in a level manner or otherwise. This property is of course within the dye itself being dependent upon the chemical structure. In general those dyes which exhaust quickly are not suitable for the dyeing of light fancy shades on account of the fact that they jump onto the fibre unevenly. A combination of several colors for the production of a mode shade is a poor combination if one of the colors exhaust much more rapidly than the others. Certain dyes such as the well known Chrysamine require the addition of phosphate of soda to the dye-bath in order to produce level results. With certain dyes more level results are secured with Glauber's salt than with common salt and for this reason it is well to follow the exact instructions of the color maker, who has investigated the dyestuff and knows best how to apply same.

Under the head of poor manipulation may be considered

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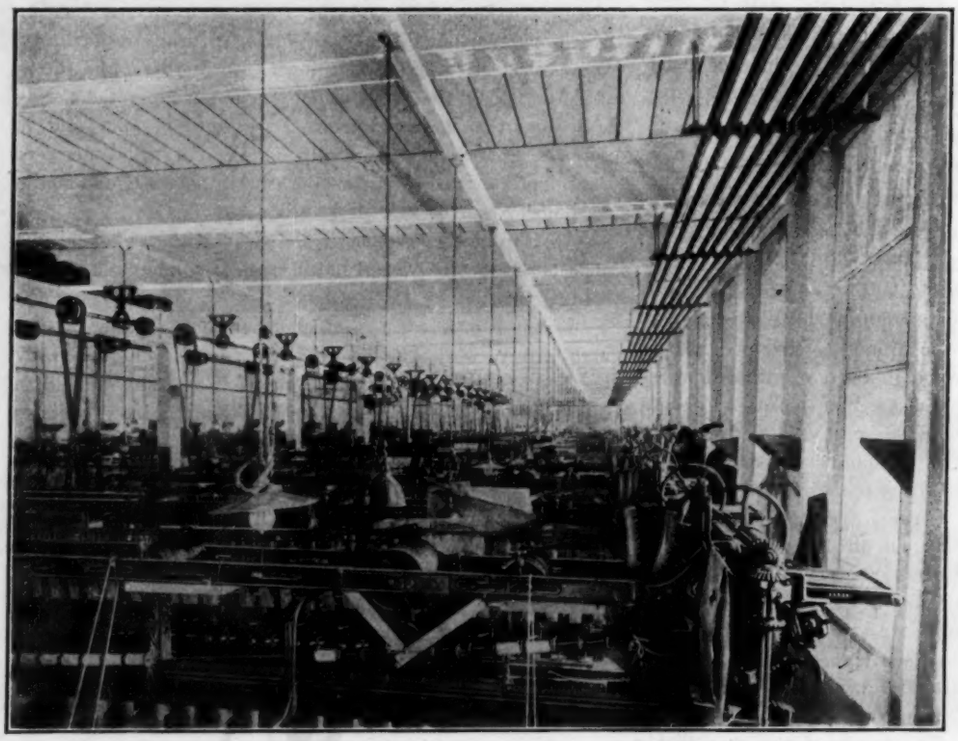

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the method by which the color is being dyed. Is the salt being added at the start or after the bath has boiled? Is the dyeing being done in a neutral bath or in one made slightly alkaline with soda? In the dyeing of developed colors is the material being protected from light? In the dyeing of warps is the color being divided proportionately between the different runs? Dyeings of sulphur colors must not be unduly exposed to the air without squeezing off evenly or the bronzy streaks will develop. There are many dyes on the market which will not dye satisfactorily by one method but will produce excellent results if the method is slightly changed.

Poor mechanical equipment may be blamed for a lot of poor work in the dyehouse and one of the most common causes is to overload the machine. This of course cannot be blamed on poor equipment but can be put down as not using a large enough machine for the work. A mill which recently started in to dye knit rolls with sulphur black in an ordinary roll machine had a lot of trouble owing tothe fact that they tried to keep a standing bath. After the dyeing the rolls were run out between the wooden rollers and placed in boxes and then run across the dyehouse and rinsed in another machine. As the color solution was not evenly squeezed out of the cloth it oxidized to bronzy streaks on standing in the boxes. In order to overcome this difficulty several things might have been done as follows. First, a heavy pair of squeeze rolls could have been mounted before the machine with a spray attachment so that the cloth would be squeezed and evenly rinsed before putting in the boxes. Secondly, the rinsing machine could have been moved directly opposite the first one so that the goods could be run direct from one machine to the other. Thirdly, the dyeing machine could have been fitted with a pump and storage tank so that the dyeliquor could be pumped off and replaced with fresh water for rinsing. Fourth, the standing both could be discontinued and the bath run off each time and while this method would show a slight increase in the cost of the dyestuff it was preferable to the mill people as it did not require any outlay for new equipment and the order for these particular goods was not very large. Therefore the dyeing was made in a fresh bath each time and a large amount of salt was added in order to exhaust the bath as far as possible. When the dyeing was finished the water was turned on and the kettle kept running while the water was changing. The rolls dyed in this manner did not show any bronze streaks and were generally satisfactory. The machine in which the dyeing took place was open at the top but it was covered over with a wooden top with canvas curtains in front so as to reduce as far as possible the oxidation of the color while the goods were running over the reel. This is an example of poor equipment for the work in hand, but by changing the method slightly the work was satisfactorily performed without buying any new machines.

In general, mills which are running on one color practically all the time should use very large machines as in this way the difference between the batches will be reduced to a minimum.

In conclusion the writer would like to say that the manner of storing chemicals and dyes as practiced in certain mills is a crime as there seems to be no attempt made to keep these materials under conditions which would best preserve their strength or reduce to a minimum the danger of fire or explosion. As a general thing all dyes should

be kept in one room and all chemicals with a few exceptions in another. The exceptions are caustic soda and chloride of lime which should be kept as near as possible to the tanks in which they are dissolved. Both of these products deteriorate if kept uncovered and chloride of lime in particular should be kept away from machinery, which it would rust very quickly, and the powder should be prevented from blowing around the dyehouse. It should be the aim of every dyer to store his chemicals in such a manner that those products which react with one another to form heat or explosive mixtures are widely separated. Thus peroxides and zinc dust or bisulphite and zinc dust, bichromates and sulphuric acid should be kept separate as these products evolve a tremendous amount of heat if combined. Peroxides in powder form should not be dropped around the floor where they may come in contact with easily inflammable matter. Zinc dust is sometimes subject to spontaneous combustion and should be kept well covered. Liquids and also dyewood extracts should be protected from freezing, while peroxide of hydrogen in summer must also be stored in a cool place. Certain dyestuffs absorb moisture from the air very rapidly but all dyes should be kept covered in order to prevent contamination with other dyes.

The writer, when a young man, worked in a mill where both Glauber's salt and hypo was used. The barrel of hypo was kept very near to the Glauber's salt. One day while intending to get a pail of Glauber's salt for a batch of woolen goods he took hypo crystals which resembles Glauber's salt very much. The result of this was that a batch of goods were badly tendered. This could have been prevented had these similar looking chemicals been kept far apart.

Some dyers make the mistake of not properly dissolving the dyes before adding them to the dyebath. The best way where a large amount is to be dissolved is to boil up in a barrel under an open steam pipe, first having stirred the dye well into cold water. Smaller amounts are best dissolved by pouring boiling water over them in a pail. Certain dyes such as Patent Blue, the acid violets and the basic dyes should be first carefully pasted with cold water and then dissolved by pouring boiling water over same. For basic dyes the addition of a small amount of acetic acid to the paste is a great help. Basic dyes should invariably be strained into the dyebath as it is very difficult to dissolve these colors thoroughly. Never bring dry color into the dyehouse proper but take your pail or barrel containing the water into the drug room and paste the color before taking into the dyehouse for solution.

The writer has probably left untouched a great many things which will produce trouble in the dyehouse but to thoroughly cover the subject would require more than a whole issue of COTTON.

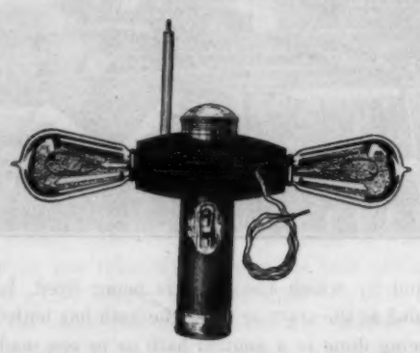
The Merchants National Bank of Boston announces the appointment of A. H. Garside as secretary of its Industrial Service Department. Mr. Garside came to the Merchants National Bank from the New Bedford Standard of which he has been textile editor for the past six years. He has also been New England correspondent for the New York Journal of Commerce and other publications and statistician for the National Association of Cotton Manufacturers.

An Illuminated Fuse Tester.

Unless some form of tester (usually crude and home made) is available, it is at present common practice to replace with new fuses, all the fuses of a cut-out box in which one fuse has blown, waiting for a future opportunity to make a test to detect the blown fuse or fuses, and to replace in stock the fuses which have not operated. Not only does this method unnecessarily consume time, but it requires a stock of fuses fully double that which answers the purpose where tests for operative fuses are made at the cut-out boxes.

An appliance designed to do away with waste of time and money to discover a blown fuse is announced, and is being marketed by R. S. Blake.

Essentially, it consists of a device to test fuses *in situ*, with safety, while the back of the fuse is illuminated by the light from a dry cell flash lamp. The tester is held in one hand, the light flashed on, and the necessary contacts are made by means of the two contact points shown in the illustration—one a stiff heavy rubber insulated wire—and



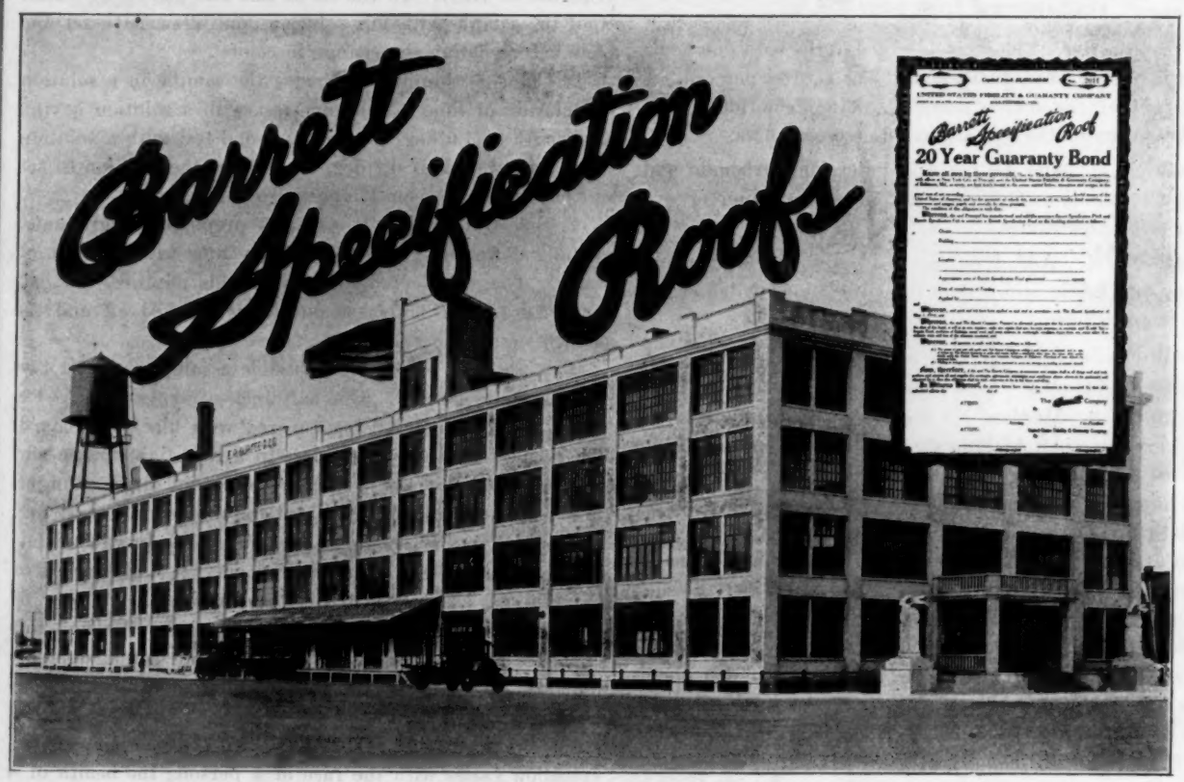
the other a rubber insulated flexible wire. The result of the test is immediately apparent by the lighting or remaining dark of the two test lamps arranged in series.

At present, the electrician who has equipped himself with a couple of sockets in series for testing fuses needs a helper to hold the light, where the cut-out is in a dark spot, as is often the case in many industrial plants, theatres, hotels, or on board ship, in mines, etc. With this combination of tester lamp and flash lamp, it is entirely possible for even a one armed man to make the proper tests.

The sockets in the Blake fuse tester are standard Edison base sockets, and any standard lamp may be used in them. Any voltage up to 500 may be tested. In making tests on 500 volts, it is necessary to use two 220 volt lamps. In making tests 110-120 volt circuits two 110 volt lamps are used.

The device is practically indestructible, and is marketed with or without the flash light, thus if the electrician is provided with his own lamp, only the tester proper need be purchased.

"There should be a place in our industries for every cripple returning from the war, except those totally disabled. It will not be necessary to create jobs for them. Suitable jobs exist. The real problem is to get employers of labor to interest themselves in the welfare of the cripple."



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(*Continued from page* 754.)

other than the dye. The skein is boiled in the bath one hour.

Bath No. 2. Add 10.0 grams (that is, 100 per cent of the weight of the textile sample) sodium chloride. Note the absorption of the dye at various temperatures.

Bath No. 3. Add 4.0 per cent potassium carbonate and 0.75 per cent olive oil soap. Note the absorption of dye at various temperatures.

Bath No. 4. Add 100.0 per cent sodium chloride and 5.0 per cent acetic acid. Note the absorption of dye at various temperatures.

Bath No. 5. Add 5.0 per cent acetic acid. Note the absorption of dye at various temperatures.

Bath No. 6. Mordant the skein in a bath containing 3.0 per cent potassium bichromate and 1.0 per cent sulfuric acid, at the boil for one hour. Then enter in a dyebath to which 5.0 per cent acetic acid has been added.

Bath No. 7. Mordant the skein in a bath containing 3.0 per cent potassium bichromate and 3.0 per cent cream of tartar, at the boil for one hour. Then enter in a dyebath to which 5.0 per cent acetic acid has been added.

Bath No. 8. Add 10.0 per cent sodium sulfate and 4.0 per cent sulfuric acid. Note the absorption of dye at various temperatures.

4. *The fastness of a dye.* The factors or influences which affect the fastness of dyes are classed as follows:

1. Those encountered in the processes of textile manufacture. These include: A. The alkaline influences met in the processes of scouring, fulling, boiling-off and mercerizing. B. The acid influences met in the processes of carbonizing, stoving, and cross-dyeing. C. The heat influences met in the processes of drying, singeing, ironing, calendering and potting. D. The oxidizing influence of the chlorine bleach bath, and peroxides.

2. Those encountered when the yarn or fabric is in actual use. A. Alkaline influences: street dust and laundering. B. Acid influences: perspiration, fuel gases and fruit stains. C. Heat influences: The high temperatures experienced in household ironing, and in exposure to tropical sunshine. D. Weather: This includes air, light and rain.

Here are twenty-four factors which affect the shade or the brilliancy of a dye, but it must be noted that they are not of equal importance for all fabrics. Some of the methods used for making the tests are here given:

1. Soap solution. Dissolve ten grams of sodium oleate soap in one liter of water. Agitate the dyed sample in this solution for 30 minutes. Make separate tests at 60 deg. C. and at 100 deg. C.

2. Alkaline solutions (weak). Dissolve two grams of dry sodium carbonate in one liter of water. Agitate in this solution for 30 minutes at 100 deg. C.

3. Alkaline solution (strong). Dissolve twenty grams of dry sodium carbonate in one liter of water. Immerse the sample for five hours.

4. Acid solution (weak). Use hydrochloric acid (of Sp. Gr. = 1.18). Dilute 100 cc. of this to one liter, with water. Spot the sample with this dilute solution and allow it to act for ten minutes, before noting the change in color.

5. Acid solution (strong). Use hydrochloric acid of (Sp. Gr. = 1.18). To 100 cc. of this add 200 cc. of water. Spot the sample with this solution, and allow it to act one hour before noting the change in color.

6. Chlorine solution. Immerse the sample in a solution of chloride of lime. Make one test with a solution having a strength of 1.0 deg. Be. and a second test with a solution having a strength of 0.1 deg. Be. Allow the solution to act on the sample at room temperature for one hour.

7. Street-dust test. A paste is prepared by gradually rubbing down 200 grams of ordinary lime with 1500 cc. of water. The sample is spotted with this mixture, then allowed to dry. Finally the powder is brushed off and the change noted.

8. Light test. Whenever possible a sample at least two inches square is used. One-half inch of the sample is exposed, the remainder being covered with black cardboard. The whole is placed under glass in a rain tight frame and exposed on a roof for fifty hours of actual direct sunlight. The months usually best adapted for this test are July and August. A record should be kept of the approximate latitude at which the test was carried out. A daily record of the sunlight is kept in order to determine the number of hours of actual sunlight in a given period. We find this exposure test to give results similar to an actual open-air light test, even though the glass may act as a filter for certain light rays.

9. Perspiration test. We find that the character of perspiration varies with the race of a person; the health of a person; the age; and the season of the year. For general information we use a solution containing in one liter: 50.0 grams of 50 per cent acetic acid and 100 grams of sodium chloride. The sample is alternately immersed and dried, and the change in color is noted.

5. *Proximate analysis of a dye.* This examination includes a determination of foreign matter in commercial products. The substances most frequently encountered are (1) Glauber salt and table salt, usually added to a dye in order to standardize it, and (2) Dextrine and glucose, usually added to dyes in order to assist their solubility.

"Standardization" means the thinning of a dye by the addition of some water soluble substance, so that a pound of the dye purchased in one month, will have the same coloring power as a dye purchased a year later. During periods when there is a dye scarcity, an unscrupulous broker will naturally seek to sell as many pounds of dye as possible. He sincerely hopes that the purchaser (that is, the textile manufacturer) will not stop to discriminate between good and bad products. Here then, is one instance where the addition of salt or dextrine in quantity is an unqualified fraud, and this condition has been helped considerably by the apathetic attitude of dye consumers during the past three years.

"Homogeniety" refers to the chemical uniformity of a dye. If a commercial dyestuff consists of a mixture of two or more dyes this is ascertained by: (1) blowing the powder on to a sheet of filter paper which has been previously moistened: (2) scattering the powder on sulfuric acid; (3) by fractional dyeing; (4) by capillary absorption, and (5) by spectroscopic examination. All of these methods are too well known to require special description at this time.

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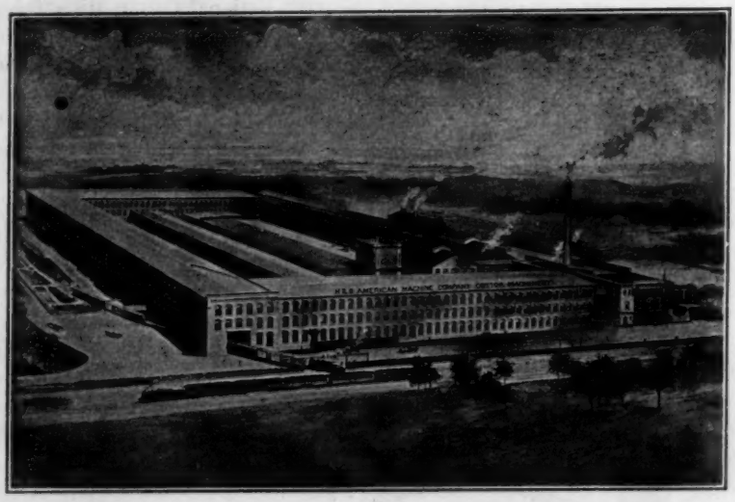

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Consumers are aware of the fact that most commercial products contain more or less "substances not dyes." In order to obtain definite information on this point and to eliminate such dyes as are grossly adulterated, it is recommended that bidders on dyestuff deliveries be required to present a statement in connection with each bid on each dye, covering the following points. It will be noted that this is not a specification, but merely a form of "Request for Information."

(1) Does the dyestuff contain more than one dye. If so indicate the constituent dyes by their Standard name (See Schultz Farbentabellen).

(2) If any dyestuff offered consists of two or more dyes, quote separately on each constituent dye.

(3) How much if any organic matter not dye is contained in the dyestuff offered under this bid?

(4) How much, if any, inorganic matter, not dye, is contained in the dyestuff offered under this bid?

(5) Quotations on dyes should be accompanied by dyed samples showing the application of the color on cotton, wool or silk, in definite percentages. (This will enable the purchaser to calculate the approximate cost for producing a shade of a given strength).

"If the present war continues three years, it is estimated that 20,000 crippled American soldiers will return during the first year; 40,000 the second year; 60,000 the third year—making a total of 120,000 disabled men to be absorbed into the industries of the country in the next three years."

The Fourth National Exposition of Chemical Industries will be held in the Grand Central Palace, New York, during the week of September 23rd. This exposition will be the largest chemical exposition ever held and it will be necessary to use four floors of the Grand Central Palace. The exposition is a war-time necessity and regarding it as such each exhibitor has planned his exhibit so that it will be of the greatest benefit to the country through the men who visit it, all of whom are bent upon a serious purpose —that of producing war materials in large quantities, and constantly increasing this production till the war has been won by the United States and its allies.

The South is again sending exhibits from some sections, and Canada too is taking the opportunity of presenting the materials it has available for development by the chemist and financier. Technical and business men over the country should give heed to these exhibits since they will show how they can meet the war-time need. A section for the glass and ceramic industry has been added with which the American Ceramic Society is co-operating.

The program for the exposition will be a series of symposiums on the "Development of Chemical Industries in the United States, notably since July, 1914." This will embrace the period since the beginning of the European war, which because of its removing the source of supply for our domestic industries inspired the development of our own chemical industries that, now, when we ourselves have entered the war, are proving so efficient. The program of motion pictures carries forward the idea of the symposiums, and pictures will be shown of the industries that have developed in so far as they can be with propriety.

Notes About Men You Know.

J. P. THOMPSON has resigned his position as second hand of spinning at the Moultrie (Ga.) Cotton Mills and accepted a position with the Pelham (Ga.) Mfg. Company.

M. A. CROLLEY, formerly overseer of carding at the Ensign Cotton Mills at Forsyth, Ga., has resigned this position to accept a similar position with the cotton department of the Atlanta Woolen Mills at Atlanta, Ga.

J. C. MADDEN, formerly with the Fulton Bag & Cotton Mills of Atlanta, Ga., has accepted a position as overseer of spinning in the cotton department in the Atlanta (Ga.) Woolen Mills.

CAPT. W. T. SHAW, JR., of Weldon, N. C., and formerly superintendent of the spinning mills of the Weldon Cotton Mfg. Co., has died for his country on the battle fields in France. Notice from the War Department announcing his death was recently received by his relatives.

GEORGE WITHERSPOON, well known in the trade for several years as a salesman for the Seydel Mfg. Co., of Newark, N. J., who has resigned from this position to accept a similar position with the National Gum and Mica Co., of New York. Mr. Witherspoon will be associated with W. M. Failor who has charge of the Charlotte office of the National Gum and Mica Co.

E. C. HUTCHINSON, JR., of Mount Holly, N. C., well known in mill circles as being connected with the Hutchinson group of mills, is now in France serving his country.

YANCEY L. YON recently wrote to COTTON announcing his arrival in France and advising that his address is Company F, 105th Engineers, American Expeditionary Forces c|o Postmaster, New York City. Mr. Yon will be remembered in many mill circles where he has served as overseer of spinning and in other capacities. He says the big day for the soldier is the day he gets his mail and he will be glad to hear from any friends with news of the doings of their mutual acquaintances.

T. H. HENDERSON, formerly General Superintendent of the Riverside and Toxaway Mills at Anderson, S. C., and lately connected with the Victor-Monoghan Mills at Seneca, S. C., has resigned this position to accept a position as general superintendent of the Clinchfield Mfg. Co. mills located at Marion, N. C.

JOHN W. CLARK has resigned as superintendent of the Erwin Bleachery, West Durham, N. C., to enter an officers' training camp at Louisville, Ky.

J. P. DILLARD, from Covington, Ga., has been made assistant superintendent and overseer of weaving at John E. Smith Cotton Manufacturing Company, Thomason, Ga.

C. F. MERRILL has become assistant superintendent of the Gastonia (N. C.) Manufacturing Company.

JOHN W. LONG has resigned as superintendent of the Delburg Mill, Davidson, N. C., to accept a similar position with the National Cotton Mills, Lumberton, N. C.

D. G. WILLIAMS, superintendent of the Saxony Spinning Company, and John Rudisil Manufacturing Company of Lincolnton, N. C., has also become superintendent of the Gastonia (N. C.) Manufacturing Company, and president and treasurer of the Rollin Manufacturing Company, of Lincolnton, N. C. He recently purchased controlling interest in the Rollin Manufacturing Company.

WILLIAM P. BOYD, son of John B. Boyd, superintendent of the Patterson Mills, Roanoke Rapids, N. C., who enlisted in the Army as a private has been commissioned a second lieutenant.

PAUL A. SCHULTZ is well known in southern mill circles as an expert on absorbent cotton and surgical dressing manufacture, and was for many years general manager of the Southern Aseptic Laboratories at Columbia, S. C., later starting and managing the plant of the Atlanta Fibre Co., at Atlanta, Ga. After leaving Atlanta, Mr. Schulz became connected with John T. Milliken & Co., of St. Louis, Mo., where he erected and managed the absorbent cotton plant for this company. In May of the current

THE SECRETARY AND PRESIDENT OF THE SOUTHERN TEXTILE ASSOCIATION "GETTING TOGETHER."

year he resigned his connection with this company and became affiliated with some interested capitalists which has resulted in the formation of a new corporation at Valley Park, Mo., known as the Absorbent Cotton Co. of America, of which Mr. Schulz is vice-president and general manager.

JOHN EDWARDS NORRIS, 75 years of age, president of the Ohio Falls Dye & Finishing Works, textile handlers of Louisville, died of an attack of heart trouble while asleep in a hammock at his home on Speed avenue. Mr. Norris was a wealthy man, and for the past ten or twelve years had not taken an active part in the management of the big plant, which is now being enlarged at a cost of about $75,000. Mr. Norris for a number of years was connected with the Bourbon Stock Yards, but organized the finishing works about twenty years ago. He is survived by no really close

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It may visit you tonight. Are you prepared to fight it? Have you Pyrene handy?

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Newport Benzo Purpurine 10 B
Newport Sulphur Navy Blue
Newport Sulphur Brown C
Newport Sulphur Green G
Newport Azo Eosine G
Newport Acid Fuchsine
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Our technical laboratories are at your disposal for the submission of your problems or the matching of your shades.

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NEWPORT TRADE MARK

relatives, the nearest being a nephew, Charles Pomeroy; a niece, Miss Mabel M. Pomeroy, and a granddaughter, Belle Norris Semple, a daughter of William Semple, of the Semple Mfg. Co., textile manufacturers.

DAVID TOUSIGNANT, superintendent of the Seminole Mills, Clearwater, S. C., and the Aiken Mills, Bath, S. C., has also become superintendent of the Langley (S. C.) Mills.

SCOTT ROBERTS, Treasurer of the Adelaide Mills at Anniston, Alabama, and President of the Alabama Cotton Manufacturers' Association is recovering nicely from a rather serious operation he has recently undergone.

HERMAN SEYDEL, head of the Seydel Manufacturing Co., Jersey City, N. J., manufacturer of chemicals, has been made a member of the Regional Industrial Commission for the Third Federal District.

HENRY W. ATKINSON has accepted the position of superintendent of the Mandeville Mills, Carrollton, Ga. He was formerly assistant superintendent at the Muscogee Mills, Columbus, Ga.

JOHN TILLETT, formerly secretary and treasurer of Jewel Cotton Mills, Thomasville, N. C., has successfully completed his training as aviator at Lake Charles, La., and has been commissioned lieutenant in the aviation section. He is now taking a six weeks' course in the pursuit branch of aviation.

H. A. JOLITZ has accepted a position as superintendent and manager of the Textile Finishing Co., St. Paul, Minn. He was formerly general superintendent of the Utica Willowvale Bleaching Co., of Chadwick, N. Y.

G. H. FAIRBANKS, formerly superintendent of the Wallace Mills, Jonesville, S. C., has accepted a similar position at Fork Shoals, S. C.

M. F. HARRINGTON, from Albemarle, N. C., has been made superintendent of Johnson Manufacturing Company, North Charlotte, N. C.

W. A. BLACK has resigned as general superintendent of the Marion Mfg. Co., and Clinchfield Mfg. Co., Marion, N. C., to return to his former position as general superintendent of the Beaumont Mfg. Co., Spartanburg, S. C.

F. E. RUSSELL has been promoted to superintendent of the Canebrake Cotton Mills, Uniontown, Ala.

C. G. FOSTER, formerly of Lavonia, Ga., has accepted the position of superintendent of the Toccoa (Ga.) Cotton Mills.

J. F. OUTEN, who was assistant superintendent for Nims Manufacturing Company, Mount Holly, N. C., was recently promoted to the superintendency.

C. W. JEFFREYS has sold his interests in the Runnymede Mills, Tarboro, N. C., and has been elected treasurer and manager of Panola Knitting Company, Tarboro.

C. E. BEALE has resigned as superintendent of Canebrake Cotton Mills, Uniontown, Ala., to accept same position at Edenton Cotton Mills, Edenton, N. C.

H. T. WALLACE has been promoted from overseer of weaving to assistant superintendent at Steele's Mill, Rockingham, N. C.

C. E. DAVIS has resigned as superintendent of the Atlanta (Ga.) Woolen Mills and accepted position as overseer of spinning and assistant superintendent of the Columbus (Ga.) Manufacturing Company.

W. D. LAWSON has resigned as superintendent at Eden-

ton (N. C.) Cotton Mills, and accepted the position of carder and assistant superintendent at Fidelity Manufacturing Company, Charlotte, N. C.

A. B. BROWN has resigned as second hand in carding at Belmont, N. C., to accept position as overseer of carding, spinning and twisting at Henry River (N. C.) Manufacturing Company.

E. T. WHITTEN, from Porterdale, Ga., has been made overseer of spinning at Henderson Manufacturing Company, Hampton, Ga.

L. C. PRESSLEY has resigned as spinner at Cedartown Cotton Export and Commission Company and accepted position as spinner at the Tallapoosa, Ga., Mills.

C. A. TAYLOR, from Draper, N. C., has accepted position of overseer of spinning at Riverside Mills, No. 1, Danville, Va.

J. M. JORDAN, from Adelaide Mills, Anniston, Ala., has been made overseer spooling, twisting and winding at Hamburger Mills, Columbus, Ga.

W. J. RODGERS, formerly second hand in the spinning room of the Clinchfield Manufacturing Company's No. 1

MAC DEMANDS FURTHER EVIDENCE. WE PRESENT IT HEREWITH.

Mill, has been promoted and made overseer spinning at the Marion Manufacturing Company's Mill.

A. F. HUNT, who has been assistant superintendent of the Marion and Clinchfield Mills, Marion, N. C., has been promoted to superintendent in charge of the mills of the Marion Manufacturing Company, Marion, N. C. Mr. Hunt has been with the Marion Company since it was started in 1909.

W. S. HUFFSTICKLER has resigned as spinner at Fidelity Manufacturing Company and accepted position of carder and spinner at Mecklenburg Manufacturing Company, Charlotte, N. C.

J. V. MC COMBS for several years the successful superintendent of the Martel Manufacturing Company, Egan, Ga., but who was transferred east three years ago to start and operate the Company's eastern mills has resigned as superintendent of the Beaver Mills, North Adams, Mass., to accept a position as general superintendent and assistant manager for the P. H. Hanes Mills, Winston-Salem, N. C. Mr. McCombs is considered one among the most successful and capable superintendents and his friends predict a bright future for him. He is another example for the child labor agitators to look on, as he began his mill career in the Clifton Mills, Spartanburg, S. C., at the age of ten years and was at one time considered the youngest overseer in the South. He will be well remembered by his friends in Greenville when overseer at Monoghan Mills after several years success as overseer and assistant superintendent of North Carolina mills. Mr. McCombs entered on his new duties September 1st.

The Theory of Graphite Lubrication.

The theory of all lubrication is to keep two moving surfaces apart. In theory this is correct, and also correct in the practice with this one exception. Any oil or grease will stand weight up to a certain limit, but if unusual weight or stress is placed upon the machine, the oil or grease will squeeze out from between the surfaces and allow the metals to touch.

Metals are never smooth. Under a microscope the most highly polished piece of metal resembles a nutmeg grater. There are little pin points sticking up, pores in the metal, tool marks and other irregularities. When the oil or grease squeezes out these irregularities interlock. This is the cause of "friction." These little pin points also break off. This is termed "wear." Tiny particles of metal get into the lubricant and, returning through the bearing parts, act as an abrasive.

The proper lubricating graphite, it is claimed, entirely overcomes this. It first fills the pores of the metal, after which it places a veneer over the entire wearing surfaces. After the graphite veneer has been secured, friction will have been reduced to the absolute minimum known to mechanics. Not only this, but wear of metals will be prevented for the reason that contact now is between graphite-and-graphite and not metal-and-metal. It is obvious that if metals do not rub together they cannot wear.

A Book on Modern Fences.

"Factory Fences" is the title of catalog No. 52 which has just been issued by the Anchor Post Iron Works, 165 Broadway, New York City. This 24 page booklet is a very handsome demonstration of the printer's art, bound in heavy flexible cover stock printed in colors. Incidentally, it is a product of the well known advertising firm of Rickard & Sloan, Inc., New York.

The contents of the book show by means of graphic illustrations the strength and unclimbable features of the factory fences and gates manufactured by the Anchor Post Iron Works. Of particular interest is the new double swinging gates with electrically welded frames on which patent is pending. These gates are made with an offset hinge and are made in the double gates in a variety of sizes from 8 feet to 24 feet and larger to order. Such gates for openings wider than 18 feet are furnished with diagonal tension braces which makes the gates extremely strong and durable. The larger part of the illustrations shown are actual photographs of the fences on the property of some few of their very many satisfied customers. A copy of this handsome catalog may be secured by any interested party on application to the New York office or to the Atlanta branch at 711 Empire Bldg.

Millions of Feet of Anchor Post Fence Protects Billions of Dollars in Plant Investment

Theft and Vandalism Prevented

Keep out! Keep off! These are the ultimata that every Anchor Post Protective Fence presents to the dangerous enemies of industry. Ultimata that are backed by a steel wall of defence that has proved impregnable in service.

Briefly the details of that steel wall are as follows: Chain Link Woven Steel Fabric of great strength and of such mesh as to prevent footholds. Top and bottom edges finished with a double twist and so cut as to form sharp barbed points. The fabric stretched tight as a drum over close-grained high carbon steel U-bar Posts held rigidly erect through the patented Anchor Post driven stake anchorage. Topped with thick-set barbed wire anti-climbers fastened on inclined pressed steel arms.

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How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Cotton Selection and Spinning Value.

EDITOR COTTON:

We have often heard that to raise good corn you have to select the seed in the ear; that you can't get as big and smooth a grain from a nubbin as you can from a large well filled ear; and that it is better to go in the field and select and gather your seed corn for the next year before you gather the rest of the corn. Now why isn't it just as important, or more so, to go in the cotton field and select the full grown, well matured, full open boll for seed to plant the next year?

If you will go in a cotton field and pick a full open boll, then pick the lint from the seed, and straighten the fibers out. You will find the fibers from that boll practically all the same length. Then pick from the same stalk a half open runted boll that is dry and open as much as it's going to be and pick the lint from the seed in this boll and straighten the fibres out and you will find them shorter than the ones in the full open boll. Then pick a green boll that is just cracked, and remove the lint from the seed, and take the cotton from the three bolls and lay it aside until the cotton from the green boll is entirely dry; then try the breaking strength of the staple from each of the three bolls and you will find by taking a small quantity of staple or fibre from the full open bole you can hardly break them with your fingers, while the same amount of fibres from the boll that opened before it matured and didn't have life and strength enough to open out full will break very readily; also the fibres from the green boll will pull apart like paper, if it is entirely dry, because it was pulled before it matured.

So you see we can have several lengths of staple, and several breaking strengths from the same stalk of cotton, even before it is ginned, and it stands to reason, since "like produces like" to a certain extent, that we cannot get as good cotton from seed planted from the last two bolls as we will from the first, and if we could hit upon some scheme to get the cotton growers to select and pick their cotton boll by boll to save for seed for the next year's planting, it would increase the spinning value of all the cotton, for the spinning value of cotton depends on uniform length of staple, and the uniform breaking strength of the staple.

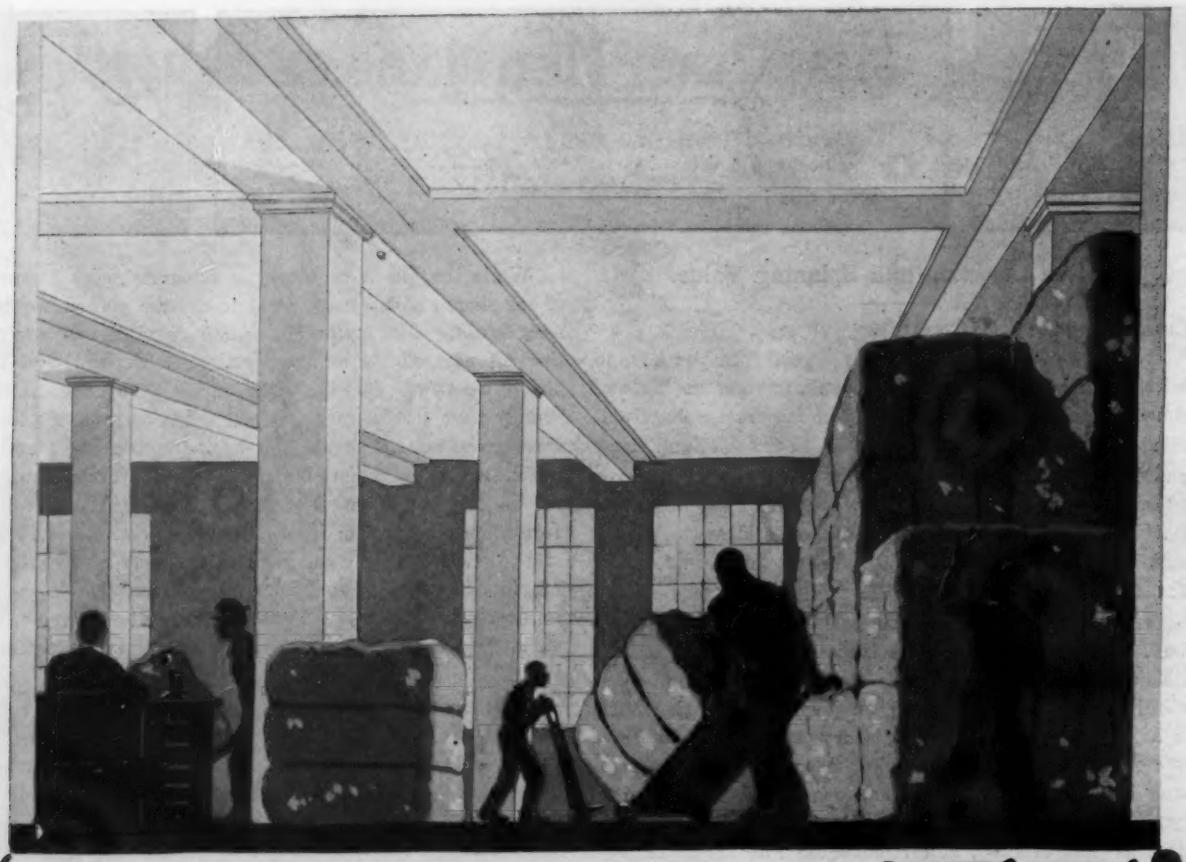
Step into any warehouse and pull the staple of a bale of cotton and if you happen to be pulling what is called one inch cotton, notice the number of short staple fibres you have to pull out and get out of the way before you get down to the staple that is one inch. Since the war began, and the farmers don't use so much fertilizer and sometimes none at all, you will find 25 per cent of the fibres from ½-inch on up to ¾-inch and 25 per cent from ¾-inch up to 1 inch, and not over 50 per cent from 1 inch to 1⅛ inch, and it is called 1 inch cotton.

While the gin is to blame in some instances for some of the short staple (and I want to say the ginners are ginning so close since cotton got so high in price they are cutting off part of the hull, especially the tip end, and that lots of these tip ends go right on into the cloth, as they usually have several long fibres attached as well as a lot of short ones, and being as light as the cotton itself and so small, they are very hard to get rid of) it is not to blame for the majority of it which comes from bolls that ripened before they were grown, from different causes. It is next to impossible to make even yarn where such a variation in length of staple is found unless we can double enough to overcome it before it reaches the spinning room, and very few mills in the South are equipped for many doublings.

If our rolls in the card room are set for 1-inch cotton, theoretically we are not drawing the fibres under 1 inch and are breaking the fibres over 1 inch and when it reaches the spinning room the fibres that are too short leave their places in the yarn, and the fibres that are too long usually come through the roll without being drawn out, and make bunches, or cockled yarn as the weights on spinning rolls are not heavy enough to break them, and leather covered rolls are not apt to break the fibres anyway, the fibres just pull on through. So anything that causes unevenness in the length of the fibres is against the spinning value of the cotton, for uneven fibres produce uneven yarn and uneven twist, as the twist will run to the thin places, and a thread, like a rope is only as strong as its weakest place.

I have often heard brokers and manufacturers say yellow cotton will spin just as good as white cotton, but this is a mistake, the fibres in yellow cotton are not as strong as they are in white cotton as can be readily found out by breaking the same quantity of fibres from each. The reason for this is that all stained cotton has not entirely matured for some reason, and not because it has rained on it, as some claim. It can rain every day for a week on a full open well matured boll and not stain it. The wet, rainy spell keeps the boll from maturing, and the hull of the boll dries, or rots, and in this condition rain will stain the cotton, but something has got to happen to keep the boll from maturing, frost, rain or unhealthy condition of the plant, for the hull of a mature boll will not stain the cotton. So the stained cotton is bound to be more or less immature cotton, and consequently more or less weak, according to the development of the bolls when they open.

Since the spinning value of cotton depends first on the evenness of the length of the fibres or staples, and next on the strength of the fibres and staples, and not on the amount of dirt and trash in it, why not grade by the staple first, color next, and dirt and trash last, since the dirt and trash have less to do with the spinning value than either of the first named? There isn't one cotton buyer in a thousand in



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The Original Daylight Saver

Dixielite was on the job saving daylight in factories, mills and warehouses long before anyone thought seriously about turning the clock forward an hour.

Dixielite is a perfected white enamel finish for walls and ceilings. It brightens up the inside of a workroom like the sun brightens up things after a storm.

Put this Daylight Saver to work in *your* mill. After the first cost of putting it on the walls and ceilings, it never costs you another cent. It never goes on strike—never demands any of the profits it makes for you—is always on the job harnessing the good old daylight and reflecting it all over the workroom.

You know how a clean window transmits so much more light than a dirty one. So it is with woodwork painted with Dixielite. All the daylight that comes in the windows is utilized. It is evenly distributed. As a consequence the operatives work better and faster. They work under more hygienic conditions. Their eyes are saved. They are more contented. There are fewer accidents. And besides, you're saving money all the time in light bills.

May we send you a sample of Dixielite—absolutely free? Write today and begin conserving daylight in *your* mill.

WADSWORTH, HOWLAND & COMPANY, Inc.

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the South, handling upland cotton that ever pays any attention to the condition of the staple, they will pay just as much for a bale in which half of the fibres are gin-cut as they will for a bale properly ginned, provided the color and amount of trash are practically the same in the two bales.

The writer was raised on a farm and one neighbor picked his cotton as soon as it opened and never let a leaf or a piece of trash of any kind get in it, while another neighbor hired his cotton picked and they picked leaves, bolls, trash and dirt with the cotton, and the neighbor that had the clean bale would get ½-cent a pound or about $2.50 per bale more than the man who had the dirty cotton. However, I am not advocating picking trash and leaves, pieces of bolls, etc., although they don't affect the spinning value of cotton nor the price received for the cloth as a rule.

From the field to the mill, cotton is the most carelessly handled of all products and I think the mills are to blame as much or more than the farmer for not paying a better premium on the clean picked, well handled, properly ginned, and properly wrapped bale of cotton. In fact, the farmer that handles it right loses money on it, for it actually costs him more than the difference he receives in the price. I have seen cotton lie on the ground in the field for weeks at a time in all sorts of weather, and in warm weather, the seed sprout all around the pile, and underneath, and then they would gather it up and take it to the gin and gin it wet, and consequently cut and chew the staple until it was about half ruined. I have seen a ginner pour as much as two gallons of kerosene oil on the saws while ginning a wet bale of cotton to make the saws shed the cotton, and then they would take that bale to town and get within ½-cent a pound as much as the fellow who housed his cotton and kept it dry all the time.

All ginners ought to be licensed, and have the license revoked for careless or crooked work, and some plan started that will make the cotton grower handle his cotton to the best advantage to the spinner. With cotton selling around 10 cents, two cents ought to be enough difference between "good middling" and "good ordinary," or "middling" and "ordinary" but with cotton selling around 30 cents this difference ought to be 6 or 7 cents. A. L. A. (Georgia.)

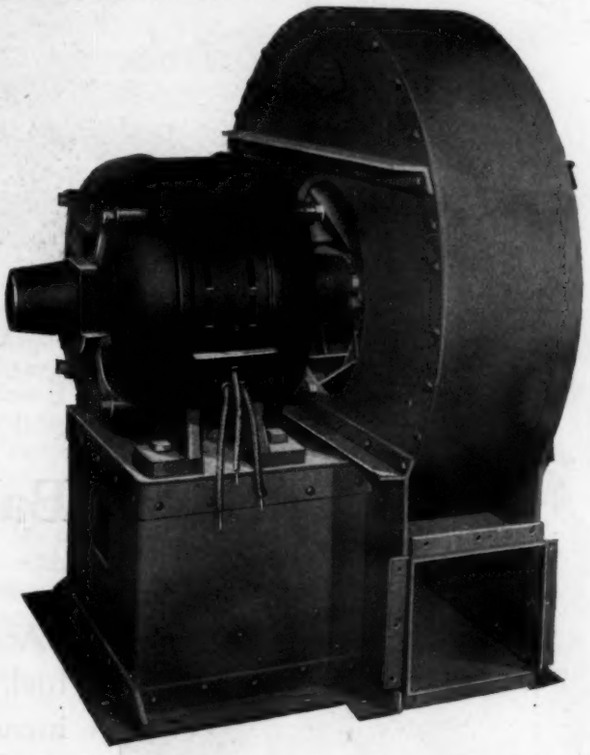
Howell Electric Motors.

The Howell Electric Motors Company of Howell, Mich., which is comparatively a new concern, has a well-equipped shop, arranged solely for the manufacture of electric motors. The principal shop, occupying a ground space of 60 by 220 feet, is so equipped as to permit the handling of material advantageously through the several consecutive processes by means of monorail trolley and hoist equipment. In this there is no lost motion, because every move is steadily along the logical course toward the place where to finished product is turned out. About 2000 Howell motors have been sold and installed in the various lines of industry, and the shops are very busy on orders in hand.

The Howell induction motors are constructed after designs by Prof. Benjamin F. Bailey, head of the electrical engineering department of the University of Michigan, Ann Arbor. They are built in sizes from ½ horsepower up to 100 horsepower, for operating at 110, 220, 440 and 550 volts, two-phase and three-phase circuits, and at all standard speeds. Motors of less than 7½ horsepower require no starting compensators, but those of 7½ horsepower and above it are supplied with manually operated compensators. The plan of the company is to specialize on polyphase induction motors, allowing close and undivided supervision in the manufacture.

The type B motor, comprising all capacities up to 30 horsepower, is built of laminations of sheet steel, riveted under high pressure between cast-iron end frames, allowing the requisite number of ventilating ducts between the laminations and end frames, to permit the escape of heated air from the interior.

Special stress is placed on the character of the bearings. These are unusually large, and the bushings of phosphor bronze are the company's two-piece, rotor-centering, oil-ring type, permitting the oil to be carried from the center



HOWELL 3-HORSEPOWER, 600-R. P. M., INDUCTION MOTOR DIRECT CONNECTED TO BLOWER.

along the bearing surfaces by spiral grooves cut in the face of the bushing. Attention is called to the fact that, especially as to motors which are belt-connected to the machines they drive, the bearing wear is mostly on one side, and when the bearing wears away on that side the air gap between the stator and the rotor is eliminated and rubbing of the surfaces results with destructive effects. In the Howell design of bearing, the outer bushing may be rotated half way around, bringing the unworn part of the bushing to bear where the tension and wear are exerted.

In the construction of type A motors, ranging from 30 to 100 horsepower, a skeleton-cored frame is adopted, the steel laminations being bolted together under hydraulic pressure between end frames, with provision for ventilating ducts in a manner nearly similar to that of the B type, only that the end frames have five projecting lugs which serve as bolt holes and locating lugs, and which enter into the cored cross ribs of the skeleton frame, holding the stator

FRICTION-LESS

Ball Bearings and the Coal Pile

"And this is the way to conserve your fuel, speed up your machines and increase your production," remarked the General Manager.

New Departure Ball Bearings

"This New Departure ball bearing is practically frictionless. Use it where your power is directly applied, have all bearing surfaces of your machines running on ball bearings, and the saving will be most pronounced from increased output all the way back to the coal pile."

THE NEW DEPARTURE MANUFACTURING CO., BRISTOL, CONN., U. S. A.

Conrad Patent Licensee.

359

in the skeleton frame. The stator is held laterally on each side by keys seated in the inside face of the skeleton frame, allowing the stator to be built up and wound and treated separately from the frame, which permits quick repair or replacement of the stator.

Each motor is carefully inspected for bearings, noise, balance, air gap, end play and oil leaks. In practice, all test sheets are signed by the tester and approved by the engineer. C. F. Norton, vice-president and general manager of the Howell Electric Motors Company, is a man highly trained in electrical work. Henry Spencer is president of the company.

A Cause for Oil Spots.

EDITOR COTTON:

On our latest drawing frames, when the cans are nearly filled, the coilers are raised gradually until the frame belt is knocked off. In order to lay the coils properly into the can, the base or turn table is set so the sweep of the strand will reach a point from the side of the can to a point slightly beyond the center of the can. When the can becomes partly full, the pressure raises the coiler slightly, and owing to the sweep of the strand as described a certain portion of the sliver is forced into the groove of the coiler, and this portion of the strand will wipe out nearly all the black oil that exists always in the coiler groove, if neglected and not cleaned, regularly.

If the frame was knocked off immediately when this happened, the oily strand would be detected by the frame tender when removing the full cans, but as the coiler must be raised to a certain point before the frame is knocked off, this oily portion of the strand is covered by the succeeding coils and thus the evil is buried, and of course not seen when the full cans are removed.

This is one cause for so much black oil found in the cloth, that often makes it unmerchantable. This is not found in mills where the coilers are cleaned often and where only a drop of oil is added after cleaning. Where the trouble does exist, the coilers are seldom cleaned and when they are cleaned and oiled, to much oil is added.

In one make of drawing frames, the journal or bearing for the coiler shaft is directly off the coiler groove and when the coiler shaft is oiled, a large part of this oil falls in the coiler groove, which later finds its way to the strand as explained. Mr. Reader, if you are in charge of a cotton mill and troubled with black oil in the cloth, see that the coilers on the drawing frames are cleaned three times a week, and that only a single drop of oil is put in the groove when oiling. Do this and your trouble will soon disappear, especially if the inside of all the fly frame bobbins are properly cleaned.

Wash. (N. H.)

Care of Licker-in Belts.

EDITOR COTTON:

The surface velocity of a lickerin on a card should be about 110 feet per minute. With this in mind, together with the number of fibres acted upon by the licker-in to every inch of lap, what takes place when the licker-in belt slips?

It is quite common to find a licker-in running slow, due to a slack belt, or dirty or dry journals. In order to make even yarn we must have as much as possible the same number of fibres in the cross section of the yarn. For this reason, we fill our automatic boxes in the picker-room evenly, and for the same purpose we have eveners on the different machines.

Now, what is the use of all this precaution in the machines preceding the card, if we allow the licker-in to lag behind or feed intermittently?

Any hesitation of the licker-in will cause heavy and light places, on that point we can have no argument. Then if this is a common evil, and if this evil causes more fibres in the cross section of the yarn in one inch and less in another, let us get busy and see what can be done to remedy this evil. A tight belt will not remedy the trouble in all cases. In some cases conditions become worse, for the reason that the journals heat which causes friction and in turn offers resistance to the speed of the licker-in.

Licker-in belts should receive the same attention as the cone belts on fly frames, and should be treated in the same way. Clean the running surface every morning and add a little good belt dressing. Try it, and see what an improvement you will find. Help win the war. Every little bit helps.

WASH (N. H.)

The Effect of Humidity.

EDITOR COTTON:

One of the great influencing factors upon the power of a mill is the temperature.

It is the effect of this that makes the mill start up hard in the morning, especially on Monday. The reason is improper lubrication, largely affected by temperature, with the further influence of relative humidity.

We have days in America known as "dog days" which occur in August, and during which peculiar feats are performed by both the temperature and relative humidity. How often in those days, in starting, have we been obliged to turn the tin cylinder back a bit and often after this precaution, either the driving or counter belt would come off the pulley? Upon a single ring spinning frame the effect of humidity far out-values that of temperature. Remember this, the higher the humidity, the higher the breaking strength of the yarn, the percentage of broken ends is less with the humidity at from 65 to 70.

It will be found that the fibres in the yarn lay closer together as the humidity is increased, producing a more compact and less fuzzy yarn, also a yarn that looks smaller in diameter. After the humidity is raised to about 75 very little is gained.

The higher the humidity the less the "fly" collected on all frames. One good practice is to wet all the floors about 5 P. M. every day. During the night the humidity will lodge in the roving and the work will run well for at least two hours after starting. Therefore, it is a good practice to wet the floor 1½ hours after starting time to be on the safe side, and every 1½ hours for the rest of the day. If you have no humidifiers, you should keep the floor wet during the "dog days." The best plan is to get humidifiers.

Williams (Mass.)

"Going After Latin American Trade," a new serial by S. G. Whitehead, begins next month. Watch for it!

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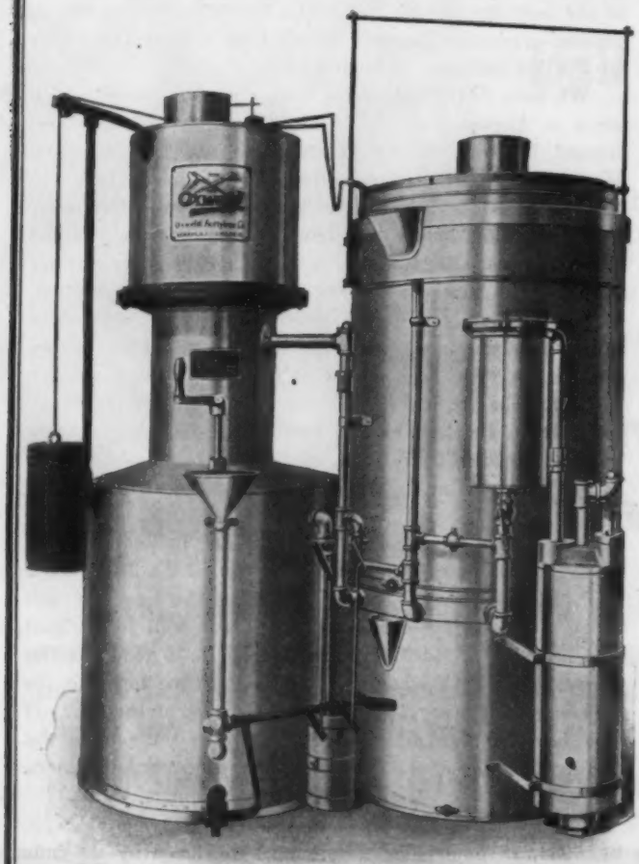

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The Influence of Foreign Trade.

BY L. W. S.

During the year 1914 the American cotton industry exported cotton goods of all descriptions valued at $50,092,993. During the same year the value of all the cotton goods manufactured in this country was $701,301,000 at factory price, which means that the cotton industry of the United States during that year exported seven per cent of its total production. Seven per cent of the total production of an industry is not very much as values go today in international trade, considering the enormous quantities of cotton goods which are produced in the world and shipped from one country to another. This export of $50,000,000 worth of cotton goods during 1914, however, had nevertheless a very clear meaning for the American cotton industry, and it exerted quite a considerable influence on the whole economic life of the nation. This has been still more the case during the last year when $158,769,741 represented the value of the bill for American cotton goods which were presented by our cotton spinners to other countries.

The American cotton industry is one of the strongest industries of our country. It employed in 1914 393,404 workmen. The capital engaged in this industry was valued at $899,766,000 and $152,423,000 were added by this industry to the total wage roll of the nation. In addition to that the cotton industry gave orders to national producers amounting to $443,523,000 which were spent by cotton spinners for materials, coal, etc.

Nearly 400,000 workmen, therefore, are interested in the well being of this industry, and thousands of investors find a profitable return in the investments they have made in cotton mills and allied enterprises. All these are also more or less interested in the expansion of this industry abroad. A year bringing much foreign trade for the cotton industry does not mean only added riches to the cotton mill owners, it benefits also every man employed in the industry. It adds to the interest return of the capital invested and it brings additional orders to the cotton growers. The cotton industry, therefore, is vitally interested in the expansion of its foreign trade and the increase in export values which has taken place in recent years is a matter of great importance.

During the year 1914 when approximately $50,000,000 of the total production was exported, the average production of one cotton operative as shown by the census figures had a value of $1800. Of the nearly 400,000 men employed in the cotton mills of this country 27,800 were employed on work for foreign account. The production of their labor was sold abroad and they would not have found employment in the cotton industry unless it had to fill these orders from abroad. As a result of its export business the industry was able to pay an additional $11,200,000 in wages to the men employed in the industry which would not have been available had the industry relied entirely on home trade.

This vast export trade, of course, is distributed over the whole United States, and there is hardly a state which does not participate in it directly. Assuming for a moment that it would be possible to concentrate in one locality the manufacturing of all the goods needed to fill the wants of our foreign customers, it would be necessary to employ the whole of the energies of Rhode Island to complete the job. Even then it would be doubtful whether the combined labor of all the factories of that state would have been able to handle the total of the cotton goods exported during 1914.

The war now has trebled the value of the cotton goods exported and to handle the trade thrust upon us during the last four years additional facilities have become necessary. Not only have existing cotton mills increased their output and also their manufacturing equipment, but a great number of new factories were built as the direct outcome of this enormous development of the industry's foreign commerce. The $158,000,000 which represent the value of the cotton goods exported during 1917 have added $100,000,000 to the annual output of the industry. The export of 1917 represents, in fact, one-fifth of the total production of cotton goods during the year 1914. To provide the goods which were exported during 1917 it has been necessary to employ 47,000 workmen, instead of the 27,800 as during the year 1914. Since that year wages have risen at the rate of approximately 50 per cent and the wage roll of the new men employed in making the goods for foreign trade has risen correspondingly. More than $44,000,000 have been necessary to pay the wage bill caused by our steadily increasing foreign connection. With the factory equipment of 1914 it would have taken the combined labor of the cotton factories not only of Rhode Island but also of Pennsylvania and North Carolina to turn out all the goods wanted.

As it is, the whole industry has felt the push which was given to the production of cotton goods during the last years. Not only has there been an increase in the demand for labor but also the demand for raw materials has been affected in many ways.

The American cotton industry is more favorably situated than any other in the world by having the raw materials right before its doors. During the year 1914, 2,679,934,778 pounds of cotton were consumed by the industry, the overwhelming majority of which was American cotton.

2,511,819,646 pounds of this went in to cotton piece goods. 88,390,208 pounds were consumed by the knit goods and hosiery industry and the rest were used in making cotton lace, cotton small goods and other cotton wares. During 1914 when seven per cent of all the cotton goods manufactured in this country were exported, approximately 190,000,000 pounds of cotton were needed to provide for the manufacture of exported goods. More than 500,000,000 pounds have been used to make all the cotton goods exported during 1917.

The influence of the country's foreign trade on the cotton industry, however, does not end here. The United States is not only a great cotton goods manufacturing country but it is also the principal producer of the raw material. Only approximately four tenths of the cotton grown in the United States is consumed by the national cotton industry, the rest is exported to other countries which in the natural course of things must be strong competitors of our own cotton industry in third markets. The price of a commodity, as a rule, is regulated by that market which is able to turn over the largest quantity of it. In the case of cotton this is not the United States, but rather the combined industries of Europe which transact their business through the cotton exchanges of Liverpool and other ports of Europe. The result of this is that before the war cotton prices were regulated principally by European quotations and demand and only secondarily by the exigencies of our own industry.

A matter of 600,000,000 pounds of cotton bought in excess of the usual consumption by the American cotton manufacturer would turn the scale in favor of the American buyer and the fact that nearly 300,000,000 pounds of that quantity could be disposed of by an increase in the export of cotton goods during the year 1917 shows the way by which this national control of at least half of the cotton production of the country could be attained. A regular export of cotton goods amounting to $250,000,000 every year, at present prices would be sufficient to account for an additional cotton consumption big enough to enable our manufacturers to retain 50 per cent of the total cotton production of the United States which would give the virtual control of the cotton harvest to American interests.

Whether the American cotton industry will be able to increase the value of its exports to this extent is a question very difficult to answer. The astonishing success of the last three years is hardly a measure to go by, considering that the war has eliminated a great part of the competition of former years. The chances, however, today are better than they have been during many years. The whole economic structure of the world is in a melting pot, and times like the present are offering themselves excellently for opening new connections. American cotton goods also have proved their value abroad and the American manufacturer after the war will find it easier to expand than has been the case in former years. So a beginning is made which finally may lead to complete success.

As it is, the industry can be satisfied with the results of the last year. It has given work to an additional 50,000 men and has added more than $30,000,000 to the wage roll of the United States. This in itself should be quite worth while all the trouble taken by those who have worked in the interest of the expansion of the foreign connection of the industry.

The recent increase in the exports of cotton goods, however, has had still another effect on the cotton industry. The American cotton industry, like all industries of the textile group, has been, in former years, distinctly a season industry. This means an industry which is fully occupied only for a number of months during the year and which has regular recurring periods of slowing down. The addition of another $100,000,000 to the exports of the industry during the last year has shortened these periods of depression, and employment in the industry has never been as regular all over the country. The entrance of this country into the war is largely responsible for this increased activity, but there is no doubt that the great influx of foreign orders in our factories during the time, when slackness used to reign, in former years, is also an additional cause. A large export trade acts as an excellent stabilizer of the activities of any industry, because most of the foreign markets are buying during the time when our own markets are getting slack. The annual loss suffered by the industry owing to the falling off of trade in certain seasons is very considerable. It means the dismissal of many thousands of workmen, and it means especially that our factories have to be built for an output much above that which would be needed were they to run all the year round on an even production. It is practically certain that if we could add still another $100,000,000 above that sold during the last year to our exports of cotton goods, there would be a chance to equalize the production of our cotton mills to such a degree as to make it possible to run all our establishments on an even load during the whole year. By doing so full employment would be secured to every workman employed in the cotton industry. All the available machines could be used at their full capacity and the return of the capital could be based not on a nine months basis but on that of a year. Manufacturers, employees, and investors would see a better return for their labor and all would be benefited by such an undertaking.

To increase our cotton exports to $250,000,000 a year, will by no means prove an easy matter. It will necessitate the cooperation of all the agencies which are at present at the disposal of the manufacturer. The possibility, however, exists and the attempt is certainly worth making.

A New Service.

The war with its resultant difficulties has added another problem. In all great crises numerous concerns spring up which are inadequately prepared to handle a business as technical as that of dyestuffs. Goods get upon the market which are not suitable; the textile manufacturer is misled; goods imperfectly dyed or which have been dyed with the wrong color come upon the market, and the public, uninformed as to conditions, finds difficulty in judging between what is good and what is bad. This is particularly harmful to an industry as much needed by America as that of dyestuffs. It therefore has become important that distributors of the finished garment should be informed as to the present color situation.

With this in view the National Aniline & Chemical Company, Inc., is extending to clothiers, department stores, and others, the facilities of its laboratories for the examination and report on any fabric in which they may be interested.

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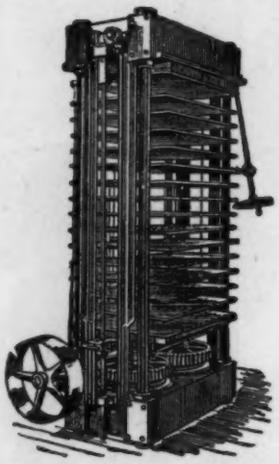

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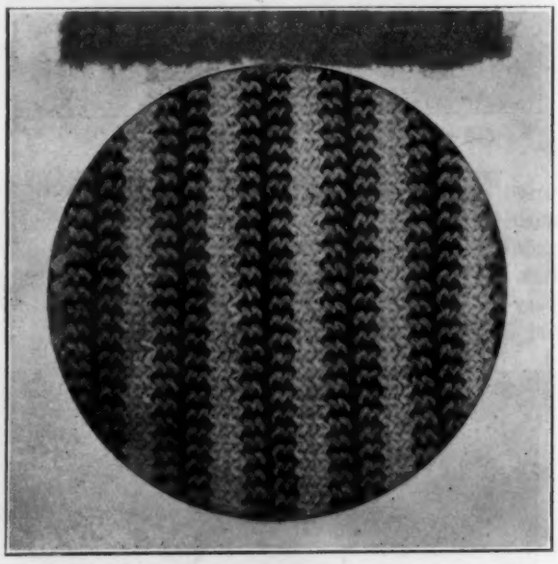
Warp Loom Fabrics

BY WILLIAM DAVIS, M. A.

The patterns given in illustration of the warp loom texture in previous articles have for the most part been of the light airy character of fabric suitable for shawls, scarfs, etc., but this by no means exhausts the usefulness of this type of cloth. It is a great advance on the purely knitted fabric in that it can produce vertical stripes in great diversity and with the greatest ease, the only requirement being to arrange the warp threads in the order of the striped pattern. Thus if in a machine there are several hundred guide points in the various guide bars, each of these can be accommodated with a different color which can be made to appear in the fabric as a vertical stripe. In addition to this, the machine has great capacity for making cloths which, to all intents and purposes, correspond to double cloth textures in the woven fabric. The face can be shown in one pattern and the back in an entirely different pattern, although it is usual to make one

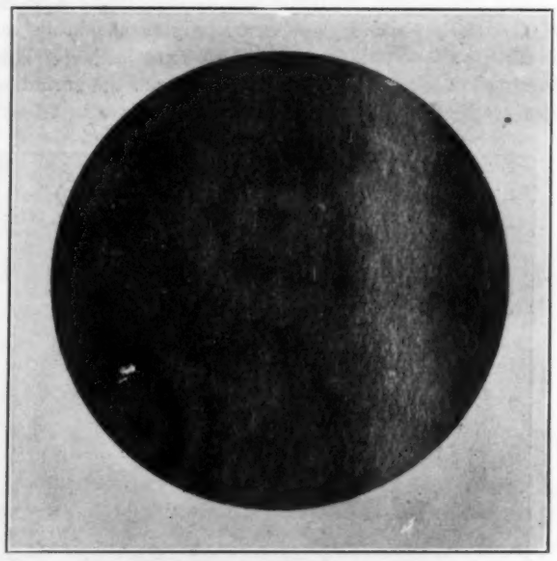


DESIGN 1. FIGURED SIDE IN THE CIRCLE, THE BACK JUST ABOVE.

side plain leaving to the other side the patterning function. Design 1 is the fancy side of such a cloth whilst directly above it is shown the appearance of the fabric on the back.

The face design represents a class of pattern which has been largely used during the past season for high-class warp-loom fabric scarves, the material being lisle thread or fine mercerized cotton. This pattern is in black and white, the warps being arranged in the guide bar with a number of threads corresponding to the widths of the respective stripes. With a single lap the two colors can be kept sharply apart so as to give a clean cut result, but if the lap is increased in scope, the threads of the black stripes are made to intermingle with those of the white with the peculiar V-shaped effects shown in Design 1. By confining the extent of the lap to the one and one, the striping threads remain practically separate but if the lap is increased to four in the direction of the right and back again to the start, then the threads intermingle in their stitches pretty freely which is desirable and effective for certain classes of patterns. The face design of this fabric appears with a solid stripe of white, whilst the black portion is interspersed with white having a solid fine line of black down the centre with the white V-shaped portions shooting out on either side after the manner of a herring-bone effect.

Now this fabric has been considerably reinforced by what is virtually a separate texture on the back of the



DESIGN 2.

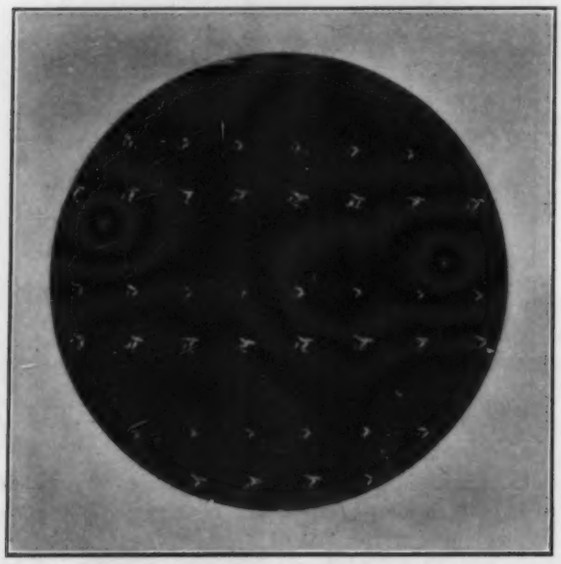
cloth and its appearance is in neutral grey tint, solid in color, with a simple lap designed to produce firmness of texture. The yarns are of stout worsted character and finely set in the machine all of which on the face and back combine to produce a result suitable for most purposes of outer clothing. For articles of the ladies' mantle class, it is specially suitable as the plain side is then used for the face of the garment and the striped side for the inside.

Design 2 gives an example of a fabric of similar type to that just described where the colors are introduced in the vertical direction and have only a short lap so that they are kept practically distinct from each other in the length. These patterned threads are produced in a thick woolen yarn which from its structure is suitable for the operation of brushing to bring the longer fibres on to the surface. The pattern of these thicker woolen threads is arranegd approximately in the following proportion: One inch black, one inch mid grey, half-inch white and one inch mid grey, which in its entirety gives a very effective vertical striped pattern. As in Design 1 the back of the cloth is worked in neutral grey and is not raised, producing a pattern and texture which are greatly in demand for "negligee" garments, such as undress articles worn by convalescents or those donned by the housewife in the morning before breakfast, named on this side with some levity "ham-and-egg jackets." These garments are made to reach down almost to the feet and tied neatly with *"corde de capucine"* are quite elegant and attractive. The same

garments are also used at seaside resorts when the wearer throws one on to proceed to the shore to indulge in his morning dip or in shorter journeys to perform his ablutions in the bath room at home.

Vesting Styles in Warp-Loom Fabric.

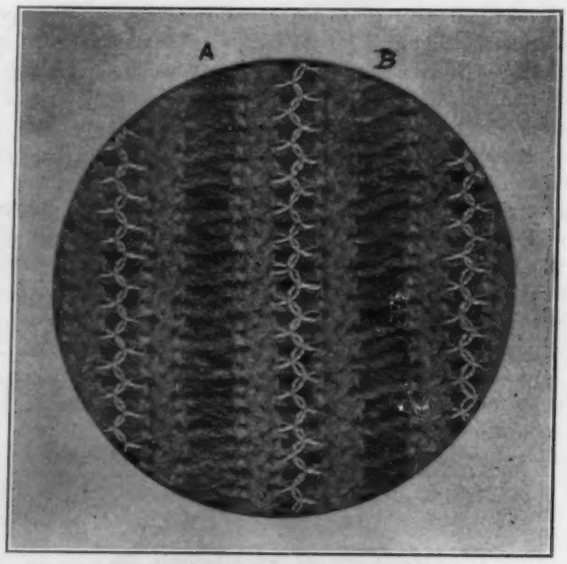
In recent years the weaving trade has suffered great competition in respect to fabrics formerly used for vestings, garments which were designed to brighten up the usually sombre aspect of the male. He shuns the bright hue in work-a-day suit as it too quickly becomes soiled and does not encourage devotion to serious and concentrated business. In his leisure hours he loves to relieve the monotony of his appearance by wrapping a fancy-colored vest around his person. After a nice dinner, at the conclusion of the day's business, epicurian delights should be made to correspond to the character of the garment he is wearing for it all assists in raising the mind from the sordid worries of the business day and plays not a small part in securing for the wearer the relaxation which he sorely needs. Of recent seasons the knitted and woven products have run on competitive lines and wearers have taken kindly to the knitted vest. The purely knitted texture, however, tends to go out of shape on account of its great elasticity and stretch, unless special precautions are taken in knitting and trimming to give the cloth greater rigidity so that it may stand up better to every-day wear. The warp-loom has been very successful in this class of fabric as may be inferred from the analysis given herewith.



DESIGN 3. A WARP-LOOM VESTING.

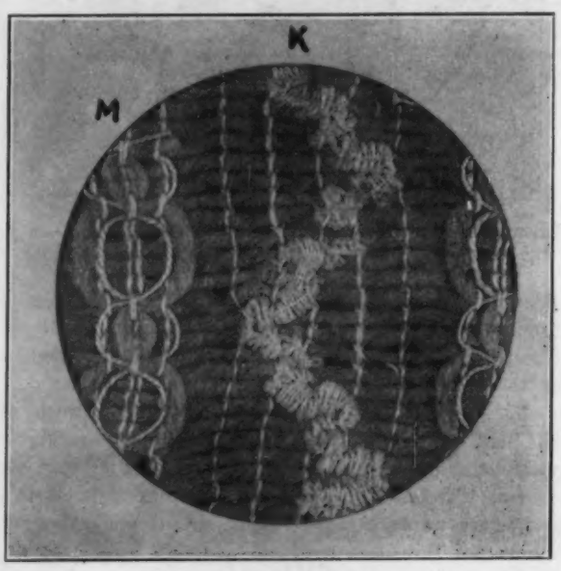
In Design 3 is a view of a fabric suitable for vesting garments and the design consists of an arrangement of spots which run more or less horizontally. The spots are not very conspicuous and are something in the nature of the honeycomb structure as we know it in woven cloth, the white yarns being found at the base of the cells of the honeycomb when not in use for spotting. These white yarns appear on the back of the fabric, the structure being on the double cloth principle mentioned for Designs 1 and 2. At the spotting, where the white has to appear on the surface of the cloth, the texture is reversed, face to back and back to face and as the white warp yarn occurs at these points of reversal, the result is to bring them onto the surface.

This pattern is quite simple in effect and serves as an illustration of what is possible in the way of elaboration of design and color, which will at once be apparent to anyone who has a knowledge of the manipulative side of textile design and color. For example, the ground color can be



DESIGN 4. A WEFT EFFECT.

varied in almost any way, although it is not usual to have much boldness in the ground tint if spotting is to be introduced. The best grounds are standard brown, green, dark blue, or fawn whilst the spots are worked in the primary or secondary colors in a lustrous material. For material for the spotting yarns it is usual to employ the best



DESIGN 5.

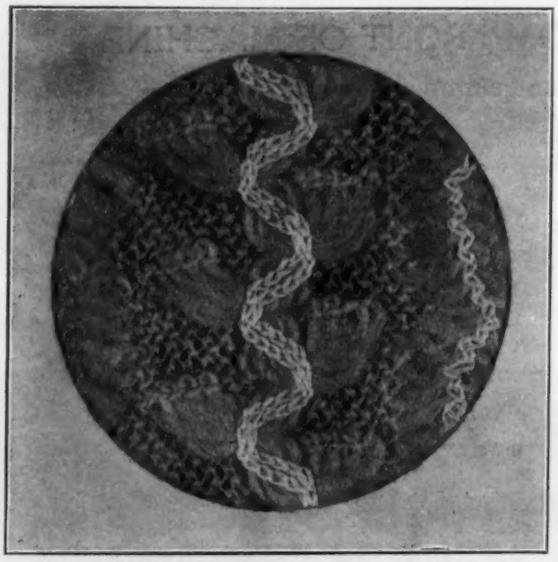
quality which the maker can afford, silk being greatly in demand. For the average goods, however, bright colored mercerized cotton yarns give very satisfactory service.

The design of the illustration shows the spots in one color in two rows which tend to be horizontal in character, but this arrangement is not a general favorite with the wearer. He usually prefers to have the spots occurring in diamond form and set in alternate two's in position.

This gives a greater freedom to the aspect of the design and is quite easily produced in the warp by alternating the colors which at present are solid. On a black ground alternate spots could be chosen, white and grey, or white and lavender, whilst white with a black and white twist thread for the mid color would also be of service. Purple spots can also be introduced on a black ground with good effect, this color being alternated with white, lavender or with black and white marl yarn. For a dark brown ground alternate spots could be introduced and varied as follows: a mono-color effect could be secured by having a light and mid-colored brown as alternate spotting effect. As alternate spotting we could introduce green and blue; red and blue; red and green; blue with tan; green with heliotrope, whilst experiments could also be made in blending delicate fawns and salmons. Similarly by selecting any other ground the changes can be rung on alternate color combinations and the designer should not shrink from trying combinations which at first appear bold and strong.

Weft Effects.

Design 4 gives another form of structure produced on the warp looms where in addition to the ordinary warp threads making their loops on the needles of the machine we have introduced a series of weft yarns inserted crosswise in the fabric. These threads are indicated in Design 4 by the letters A and B where they will be noted to fill out a considerable portion of the pattern, as they stretch



DESIGN 6.

from the one warp effect to the other. This is in the form of a thick soft spun thread laid across the fabric from side to side and which forms the basis of the chief ornamental features of the design. In this pattern the introduction of the weft serves as the ground work of the texture and on this comparatively little of the more ornamental yarns are necessary. A very effective design is forthcoming from comparatively small weight of fancy yarns.

The appearance and function of these weft yarns are even more pronounced in Design 5 where the weft yarns are inserted into the fabric to the number of 8 picks per inch and are held together by a very plain form of loop made by the warp threads. These threads are worked something after the appearance of a plain crochet stitch and serve to bind the weft yarns and hold them in position. The result is that from the most meagre patterning materials we can secure fabrics quite ornamental in character and suitable for many purposes of occasional wear. The patterning features are indicated at K which is a thick chenille yarn running over the surface of the fabric, while at M we have a simple form produced by the lapping guide bar of the warp loom. The real binders of the fabric are threads of white and heliotrope in two-fold mercerised cotton. Design 6 is an example of a rather striking tree shaped pattern made in the thick woollen thread bound by the white mercerized to give it stability and retain it in position.

The Conference on Knit Goods Packing.

Manufacturers will be required to provide a more economic form of packing and distributors will have to adapt stock-keping methods in store and warehouse to the greater use of paper and fewer strawboard boxes. Any sacrifice that may be made in this direction will be secondary to the needs of the government in the war program.

This in effect was the ultimatum of the Conservation Division of the War Industries Board at a conference with knit goods manufacturers, jobbers and retailers, in Washington, on August 15. The purpose of the conference was to obtain the widest possible range of opinion on the feasibility of substituting paper packing for strawboard boxes for conserving space in transportation.

By way of preparing the minds of the various interests for what was expected, Mr. Ware, of the Conservation Division, stated that eight times the number of cars used in May for transporting shipbuilding material from interior points to the several yards would be required in September. Then, too, there will be continued movement of troops and a greater pressure on transportation companies for cars for hauling clothing and other supplies for the army and navy. The government, it was stated, already had bought 3,000,000,000 feet of sheathing and flooring lumber—the type that goes into box shooks and packing cases. One lumber shipping concern alone is 5000 cars behind in deliveries because of the scarcity of cars.

The first spokesman for the jobbers was John H. Schofield, Sullivan & Co., Philadelphia, and president of the Association of Knit Goods Jobbers. Mr. Schofield was prepared, with a variety of strawboard boxes, to show the desirability that their continued use be permitted; that generally they were not sufficiently durable to warrant the assumption that much dependence could be placed on carryovers. He showed also that there could be a material saving in the construction of the boxes and the manner of packing in boxes.

Mr. Schofield made a strong plea for the strawboard box, as did the most of those who followed. He thought there would be a tremendous waste in sweaters packed in paper only, and serious damage to underwear if not in boxes. He exhibited a box, containing 9½ stockings, of the same size as a box containing 11½s, showing a considerable waste of board. In a box containing a dozen knitted toques there was space for another half-dozen, and a box of size 42 sweaters was large enough to hold twice the number. Mr. Schofield contended for boxes of a minimum size for the purpose intended.

Displayed on a table were a dozen stockings in paper

ALWAYS FIRST WITH — THE — LATEST

BANNER

ALWAYS FIRST WITH — THE — LATEST

FULL AUTOMATIC

HOSIERY MACHINES

SIMPLICITY — SPEED — PRODUCTION — QUALITY

Four important things to consider when buying Hosiery Machinery.

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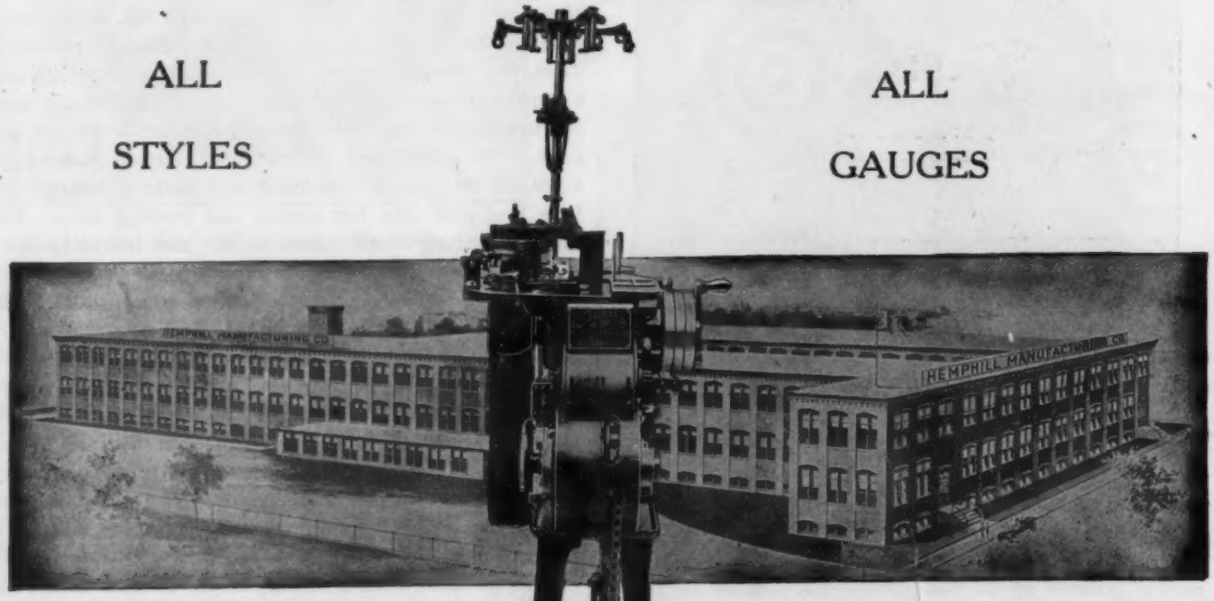
Write for full particulars and samples of work.

ALL STYLES

ALL GAUGES



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New York Office, Room 601 Leonard Bldg., 350 Broadway, New York.

Philadelphia Office and Showrooms, Rooms 205, 209, 210, Colonial Trust Company Bldg., 13th and Market Sts., Philadelphia, Pa.

packing. The wrapping was broken and the contents exposed. On the other hand, Mr. Ware, after the conference, showed a dozen silk hose in paper packing that had been received without the slightest impairment as to apperance. The stockings in this instance were laid between strips of strawboard before being wrapped.

A. M. Stewart of E. M. Townsend & Co., New York, exhibited underwear similarly packed, demonstrating the possibility of eliminating the box and saving at least 50 per cent of the board, besides procuring a package susceptible of compression and occupying less space in transportation.

Norman Johnson, Richmond, Va., secretary of the Southern Wholesale Dry Goods Association, was a pronounced advocate of the strawboard box, making a plea for consideration of the interests of the smaller retail merchants. Replying to the representation that it might be practical to pack cheap hosiery in paper, Mr. Johnson said: "I have talked with 300 cross-road retailers; they say, 'there aint no cheap hosiery.'"

The bulk of the distribution of knit goods in the South, Mr. Johnson continued, is through the small general stores, which handle anything from silks to fertilizers. He pointed to the damage that would be sustained to knitted articles if a store clerk selling lime, prunes, nails or fish were suddenly required to give attention to a customer wanting underwear, stockings or a sweater and he had to take the article out of a paper package and rewrap it after showing. "The consumer," he said, is the fountain source of the country's prosperity. When you hit the consumer you hit the country merchant, and destroy more in merchandise than you can save in shipping space."

F. L. Chipman, of the National Association of Hosiery and Underwear Manufacturers, and chairman of the Knit Goods War Service Committee, also made a plea for the boxes, in the interests of the retailers, who, he said, would be more affected than the jobber. This was objected to by Mr. Schofield, who made the point that whatever detracted from the success of the retailer affected the jobber.

Mr. Chipman suggested that the matter of more economic packing be left to a committee to be chosen from the Knit Goods War Service Committee. This received the approval of Lincoln Cromwell, chief of the Knit Goods Section of the War Industries Board, and was sanctioned by the members of the Board at the table, with the warning, "In two weeks we shall call on you for a detailed, specific statement as to what contribution the knitting industry can make to the war program in the saving of space in transportation."

What appeared to be a convincing document in support of the strawboard box was submitted by R. L. P. Reifsneider, also of the National Association of Hosiery and Underwear Manufacturers, who also left with the board a paper carton such as is being used successfully by a middle west hosiery manufacturer. The document submitted by Mr. Reifsneider was from one of the larger underwear manufacturers, and set forth the importance of providing for the smaller merchants who buy in quantities of from two-twelfths of a dozen to a half dozen of each of a number of styles or sizes.

"How about reducing the number of your styles?" asked a member of the Board.

In response to this Mr. Stewart, E. M. Townsend & Co., said: "Our mill formerly made about 300 styles. To day we are offering not more than thirty."

Mr. Stewart exhibited underwear in three folds, showing a saving of 16¼ per cent of space as in contrast with the ordinary method of folding He thought that by eliminating the box and placing the garments between strips of strawboard the saving might be 20 per cent.

Mr. Carr, Durham (N. C.) Hosiery Mills, while regarding it necessary that there be more economic packing, feared damage to merchandise packed in paper. He thought paper might be adapted with safety to low-end goods and certain grades of seconds. Referring to J. P. Quinlan's three-fold hosiery for saving space, Mr. Carr said he thought the three-fold could not be applied to some types of stockings. He was in favor of eliminating so far as possible the paper used in the finishing of boxes.

It was the consensus of opinion that the fly-paper was not necessary, although one merchant felt that it was a very important part of the packing, since it was a factor in protecting the contents of the boxes.

While the opposition to the discontinuance of the boxes came from retail merchants at the conference, a representative from Filene's, Sons Company, Boston, Mass., said, "We are willing to receive much of our merchandise in bulk. The deterioration and waste will not be nearly so great as the shipping that can be saved."

The representative of Filene's pointed out that apparently there were two problems to be solved—one for the small merchants, the other for the larger dealers. Those without good stock-keeping methods, he admitted, might find justification for opposing paper packing.

The opposition to the universal use of paper was almost unanimous. There was a unanimity of opinion also that boxes could and should be made to fit the contents, and that there ought to be a minimum of packing in less than half dozens and none in less than dozens except when absolutely unavoidable.

Judging from the sentiment of the War Industries Board members at the conference, as voiced at times, packing will be largely in paper and bulk, for low-price goods, strawboard protection for top and bottom of some classes of goods wrapped in paper, and a material reduction in the sizes of boxes that the Board may permit for better grades. It was developed that there is a greater shortage of strawboard relatively, than of paper, the explanation for this being the fact that the government requires on munitions work much of the machinery for making board.

A mild sensation was injected into the conference when the representative of a very large hosiery manufacturer suggested that a great many freight cars might be saved for war purposes if civilian freight were loaded in cars by others than union freight handlers. When we investigated to ascertain why more cases of hosiery were not being loaded in a car," he went on, "we were told by the men that the union did not permit them placing one case on top of another." They were loading about 70 cases to a car. We then put four of our own men on the job, and since then we have been loading 170 to 185 cases per car."

"I think we had better not get into a discussion of labor," observed a member of the Board, "lest we be kept here for more time than is at our disposal."

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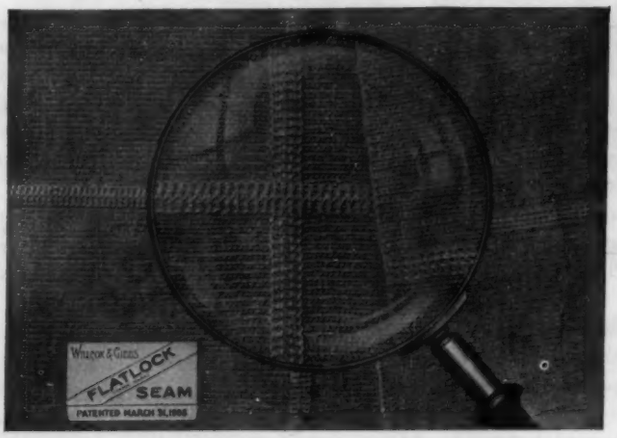
The FLATLOCK Seam is absolutely flat—a perfect union of abutted cut edges

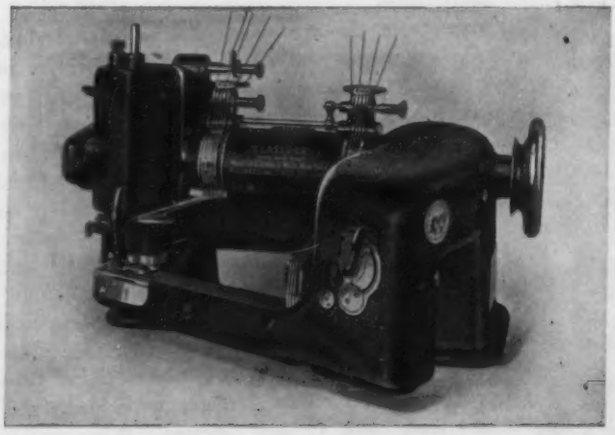


GROWING DEMAND

The increasing preference on the part of Knit Underwear manufacturers for the FLATLOCK seam is shown from week to week by the new names added to our already long list of customers. From the first to the last installation, the Flatlock Machine for making this seam has been a pronounced success.

ECONOMY OF PRODUCTION

While formerly a seam, only **approximately** flat, was made in TWO operations, today, an absolutely flat seam **(as thin as the fabric)** is produced in ONE operation. This, of course, is an economy to the manufacturer.



Comfort To Wearer

An additional benefit to him, however, lies in the comfort and service to the **wearer** of Flatlock seamed garments. This brings "repeat" orders direct or through the Retailer, Jobber or Wholesaler. To our mutual advantage we are stimulating interest on the part of the wearer by direct canvass through appropriate channels.

A Trial Costs Nothing

It will pay you to use the Flatlock Machine as it is also paying others. A trial of this now famous machine will convince you.

Trade Mark

Reg. U. S. Pat. Off.

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Trade Mark

Reg. U. S. Pat. Off.

John W. Scott, of Carson, Pirie, Scott & Co., who is Director of the Textile Division of the War Industries Board, replied to those merchants who argued in favor of boxes on the ground that their use permitted a more attractive display of merchandise than if in paper packing. "It is not a question of attractiveness," said Mr. Scott. "It will be a matter of buying what you will have to buy and as you can get it. We have yet to rise to an appreciation of the economies that all of us will have to practice to win this war."

It was pointed out during the conference that packing will not enter largely into merchandising, for the reason that merchandise will be so scarce and the demand so great that the consumer will not wait for display, but without waiting for display, will rush right off to get what is wanted The dealer will speedily discern this willingness to accept knitted articles in paper packing and will buy as usual for taking care of his trade.

Nevertheless, once the edict of the War Industries Board has gone forth there probably will be competition among manufacturers and distributors for supplying the most serviceable and attractive packing possible without violating established regulations.

It is expected the new regulations on packing will go into effect on January 1, notice to this effect coming out probably in September. Meanwhile there may be a scramble for knit goods in boxes, which promise to be very scarce soon after the War Industries Board makes its final announcement.

Knit Goods Men Voice Objections.

A ringing protest against regulations which it was reported would be established by the Philadelphia cotton yarn trade under the action of the price fixing committee of the War Industries Board was registered by the Pennsylvania Division of the National Association of Hosiery and Underwear Manufacturers at a meeting on August 17 at the Mineral Springs Park Hotel, in Reading, two days after the prices went into effect.

It was announced on the word of large yarn commission houses that while the prices of the War Industries Board remain in effect orders for yarn net weight would not be accepted—that buyers would be required to pay for the paper wrapping of cones and case lining, amounting approximately to 1½ per cent of the gross. Immediately this announcement was made, a half dozen knitting manufacturers were on their feet in opposition to paying for wrapping paper at the high prices of yarns, and strong language was employed in expressing the sentiments of yarn consumers.

Several manufacturers thought it was about time that knitting mills undertake to break the shackles imposed by the spinners, and it was freely predicted that if the present attitude of the latter be adhered to there would be found in the Schuylkill Valley enough capital to establish mills sufficient for spinning practically all the cotton yarn consumed in Pennsyvlania.

The secretary was directed to invite the Knit Goods Manufacturers of America to join the National Association of Hosiery and Underwear Manufacturers in a movement for resisting the proposed gross weight plan of invoicing yarns, and it was made plain that purchases will be delayed so long as possible while it is the disposition to compel manufacturers to pay for the paper wrapping, particularly in view of the fact, judged by experience, it was stated, that the wrapping probably will become heavier rather than diminish in weight. The following were appointed a committee to at once confer with the Cotton Yarn Merchants' Association of Philadelphia, with a view to arriving at a reasonable selling basis, to report at the September meeting of the Pennsylvania knitting manufacturers:

E. C. Matlack, Progressive Knitting Mills, Royersford.
J. B. Lesher, Unrivaled Hosiery Mill, Williamstown.
Walter Moyer, Ephrata.

It was brought out that immediately after the report of the War Industries Board price fixing committee had been made public, yarn houses which had been negotiating with manufacturers approached them with a view to closing the transactions. In several instances the manufacturers, when they learned of the gross weight ultimatum, refused to enter into contracts. It was the opinion of a member that manufacturers ought to defer purchases until forced by actual needs to come into the market, or until an understanding between mills and yarn interests shall have been reached for mutual fair trading. Furthermore, it was regarded questionable whether manufacturers would be warranted in buying yarns beyond immediate requirements, particularly as the prices announced are subject to revision October 1.

This was the attitude of those who spoke on the subject, in the face of the prediction that deliveries would involve a greater degree of speculation than would prices. It was demanded that when the price fixing committee again meets to revise prices, a representative of the National Association be permitted to participate in the conference.

That deliveries will be uncertain and probably worse than uncertain was the conclusion forced by H. M. Jenkin, of the Reading Railway freight department in Reading, who delivered an address full of instruction for shippers. Conditions are bad now, and they will be worse, he said. He strongly advised consolidation of car lot shipments. These would get through with reasonable promptness, he assured his hearers, whereas case lots will be subject to serious delay, due mainly to congestion at transfer points and inefficient freight handlers as well as negligent and incapable help in freight offices. The more serious problem, Mr. Jenkin pointed out, is the scarcity of cars, and this promises to become more acute than at present.

This view was supported by an extract from a form letter of the United States Navy Department addressed to all Navy contractors. This letter reads in part:

> As time progresses the volume of traffic will increase. Certainly more rapidly than it will be possible to increase freight equipment and terminal facilities, including storage. The object of this communication is to impress upon all concerned the absolute necessity for co-operation in the endeavor to have moved during the period prior to the time for bad weather such materials and supplies as are or will be needed later.

Mr. Jenkin's advice was to consolidate inbound and outbound freight, arranging for car lots wherever possible, as already is in effect in some of the larger cities. The idea is to so centralize purchases of yarns intended for any given center that delivery may be made in car lots. Spinners in the South and East will be asked to co-operate in such a movement.

The Reading manufacturers took immediate steps for complying with the suggestions of Mr. Jenkin by providing

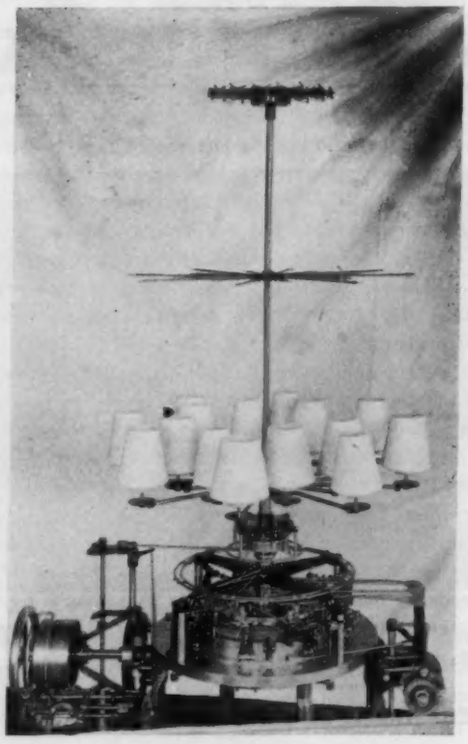
Wildman Style W. T. Stop Motion

The Ideal Stop Motion for Plating and all two thread work as it stops the machine when a yarn breaks at the carrier.

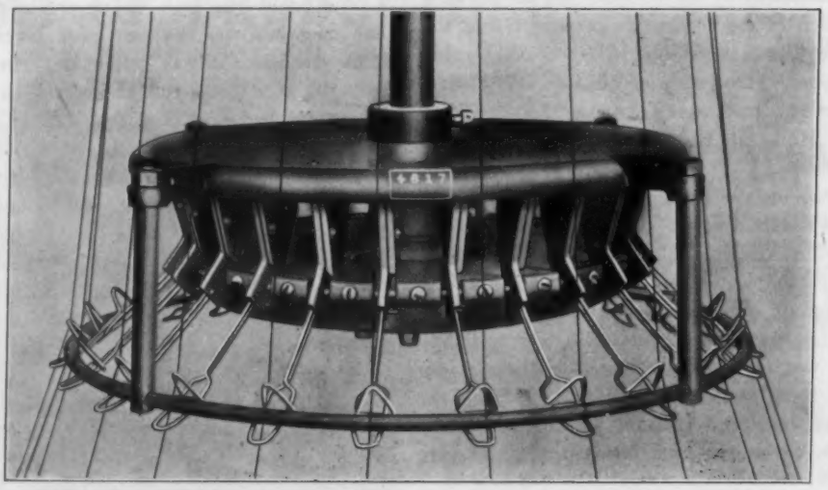
Easy to thread.

Not affected by lint.

Working parts very accessible.



On Machine



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for the appointement of a local traffic manager to look after the shipments of all mills in the Reading district. For facilitating such an appointment and securing the widest possible co-operation a suitable committee was appointed.

The committee arranged for an immediate meeting, with the prospect that at the next meeting of the Pennsylvania knitting manufacturers, at Galen Hall, Wernersville, September 14, the plan will be in effect and freight conditions in that territory materially improved both as to incoming and outgoing shipments.

Mr. Oberlaender, who was the originator of the car lot consolidation movement for Reading pointed out that it was the duty of manufacturers to see that cars were loaded to capacity and thus assist in saving every cubic inch of space. Also, he said, we should unload cars immediately, so that they may be used for other shipments, and we owe it to the government and shippers to advise the railroad company immediately a car has been unloaded.

Referring to the inclination of some consignees to defer unloading as long as possible, Freight Agent Jenkin stated that not infrequently his office receives an inquiry as to when demurrage will start. His advice was: "Unload cars immediately they have been placed on your siding; then there will be no demurrage."

The meeting was in thorough accord with the suggestions of Mr. Jenkin and it was apparent that he would receive the active co-operation of manufacturers in the Reading district for relieving freight congestion.

It was brought out that not all the trouble lies with shippers; that many freight agents and railroad clerks are lacking in the knowledge necessary for instructing shippers in the matter of routing, and that not a few are indifferent or incompetent. Then there is delay also from too close obedience to the "Red Tape" deity. For illustration, ten days were consumed in getting a shipment of coal ten miles, from a mine to a mill, simply because the mine happened to be in one county and the mill just across the border in another. The fuel controller in each county refused to take any step that might be construed as an encroachment on the prerogatives of the other.

As showing the obstinacy of freight agents in some of the smaller towns, instances were cited of the loading, under railroad authority, in two cars a shipment that could have been loaded in one.

Manufacturers were urged, when entering into contracts, to see that the approximate size of the cones be specified. Otherwise, it was feared, small cones would be used to the extent that their weight might not be covered by the two per cent cone allowance, which is to continue under price regulation.

To have fixed prices to only October 1 places the consumer of yarn in no better position than he was before regulation went into effect, was the opinion of leading manufacturers at the meeting, and it was the general belief that no great activity in the yarn market will be witnessed for some weeks—not at any rate until stocks in warehouses have been pretty well consumed.

It was stated on the authority of several yarn commission houses that all shipments of yarn under new contracts would be made f. o. b. shipping point and no freight allowance, and that the selling terms probably would be net either 30 days or 10th of the following month.

Knitting manufacturers, it was observed, are not in position to offer serious objection to the shipping terms, as nearly all are now selling f. o. b. mill station. If they prefer that freight be prepaid and insist on cash discount a sum sufficient to cover these items will be provided for in the invoice, leaving the buyer still to pay only the maximum net price of the yarn according to statements of Philadelphia yarn merchants.

If the contract calls for yarns dyed, the seller will charge the buyer with the actual cost of the dyeing, plus a "fair profit" on the dyeing cost.

Violent opposition to the substitution of paper for strawboard box packing was voiced, and the Association was instructed to transmit to the Conservation Division of the War Industries Board the sentiment of the meeting.

Discussion of the prospective shortage of bleaching materials brought out the fact that at least two mills have been notified by chemical houses that their contracts with the mills cannot be filled, that the supplies have been taken over by the government.

The Knit Goods Market.

Beyond the practical certainty that knit goods of all descriptions will be scarce, there is little on the surface of market conditions that carries comfort to manufacturers.

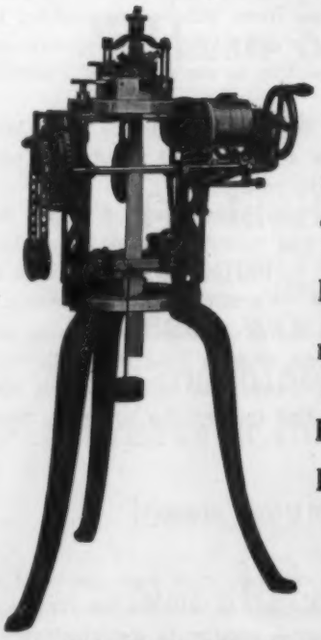
Mills are assured of high prices and a market for about all they can produce, but against this is the fear of diminishing profits, for help—and not much of it is available—will insist on increased pay. While nearly all were favorable some weeks ago to yarn price fixing, to halt spinners in their price flights, it was said, manufacturers now see no relief in the schedule of prices reported out by the War Industries Board. Their views on this subject are understood to have been rather accurately stated at the recent meeting of the Pennsylvania knitting manufacturers in Reading.

To make matters worse for manufacturers, fresh complications are coming to the front day by day. Not the least of these are the proposed innovations in packing, outlined at a conference before the War Industries Board in Washington, and the new situation in bleaching materials which is fast developing.

It is a matter of little surprise that in spite of the more acute shortage which seems certain, the market is sluggish. Buyers, while admitting they will want merchandise, appear to be in no hurry about making commitments for beyond a very short time. True, there are jobbers who are prepared to place orders for Spring, but mainly they will consider transactions with only such mills as have a reputation of delivering, regardless of price advances. On the other hand, manufacturers generally are courting no relations with merchants except those considered of gilt-edge credit rating. The admission of uncertainty thus is reflected in the attitude of buyers toward all but absolutely responsible mills and that of manufacturers toward merchants who have a record for cancelling an order in a declining market.

While the market has been slow and quiet for several weeks, there are reasons for anticipating marked activity very soon, especially as the time is approaching when merchandise for Spring must be purchased, and recent develop-

H. BRINTON CO.



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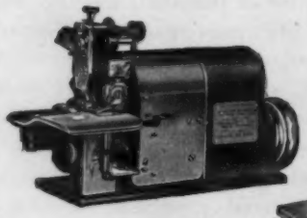

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Manufacturers of
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Cylinders and Dials

ments point to increasing scarcity in some lines in particular.

A prospective shortage of bleaching materials and consequently a scarcity of Bleached goods is indicated in instructions from the Knit Goods Section of the War Industries Board that consumers of lime or chlorine for bleaching at once report their probable future requirements of these chemicals, for both war contracts and civilian use.

Subsequent advices are to the effect that the government is investigating the various elements that go into the bleaching of cotton fabrics, both knitted and woven, and that probably it will be necessary to organize the usage in the knit goods industry as to both chlorine and lime bleaching.

That the investigation referred to in the official advices really was under way some time in advance of the request for information from manufacturers as to their needs is indicated by the fact that several knitting mills were advised by chemical houses with which they had contracts that the contracts could not be filled, the government having taken over the establishments producing the chemicals.

The presumption is that one effect of this new phase of the war needs will be to create an insistent demand for bleached goods—underwear and hosiery.

As it is probable that an order for more economic packing may go into effect about January 1, it is believed too that there will be a scurrying for hosiery, underwear and sweaters packed in strawboard boxes, as retail merchants will want to accumulate quantities of the boxes for stock keeping during the period of paper packing.

To offset the comfort which it might be assumed manufacturers would extract from the prospective greater demand is the reported placing of an order with British mills for part wool underwear for American troops abroad and the recent notice from the Knit Goods Section of the War Industries Board that it would buy no more seconds of underwear. As counteracting this is the well defined rumor that shortly the government will want very large quantities of cotton underwear for the men of the emergency fleet. Several million garments, it is stated semi-officially, will be required. They probably will be knitted from 36 combed peeler.

The statement that the United States purposed equipping to some extent its troops in France with underwear made abroad was brought by an Australian who reached New York recently. He is quoted as saying that mills in England have orders for underwear that will keep them running well into 1919. This coming on the heels of the announcement that General Pershing had bought in Switzerland 1,000,000 watches for the troops under his command almost causes some American manufacturers to feel that their activities are not receiving the recognition to which they believed they were entitled.

The buying of underwear in England for the American army probably can be ascribed to the same reason that was given for the purchase of outer clothing for soldiers fighting under the American flag—the desirability of averting the necessity for carrying wool to this country and shipping it back to France in bottoms that are needed for carrying commodities that cannot be obtained anywhere but in the United States. Tonnage for this purpose, it should be remembered, is very necessary.

Perhaps the Australian referred to had an ulterior motive in bringing to this country the story of millions of garments for American soldiers being made abroad. He may have been a buyer, interested in bearing prices. Nevertheless, there is no little dissatisfaction among manufacturers with the attitude of government purchasing agencies toward underwear mills.

Why will not the government accept seconds, as formerly, is asked? It is pointed out that these garments are not impaired as to wear and that they are just as sanitary as firsts. The civilian public must be educated to the use of the slip-overs before there can be any strong demand for them, it is felt, whereas they could be utilized by the quartermaster's department without the slightest discomfort to soldiers. Unless mills get a fair price for seconds, it is pointed out, they will have little profit on the firsts which went to the army.

It is intimated that perhaps the placing of orders with foreign manufacturers may have been a factor in the decision to accept no more seconds for the present. In any event, some one has kicked up a rumpus among underwear manufacturers in their relation with the government. The disposition is, however, to make the best of the unsatisfactory situation and be patient, for it is the common belief that prices will harden rather than decline even fractionally, and that the predicted scarcity will materialize as the next season approaches, so that market firmness may be looked for while the fighting goes on.

That jobbers will operate as cautiously as manufacturers should is a foregone conclusion. Jobbers realize that the future does not promise any such large profits as they have had in the last two years in a continually rising market and there will be a diminishing tendency toward speculation. This should operate to the advantage of manufacturers who will have the patience to continue selling for only a few months and place the market more nearly in their control. Heretofore mills which sold heavily have seen jobbers taking handsome profits in resales—profits which might have gone to manufacturers themselves. An instance which came to light yesterday will serve to illustrate.

A retailer showed confirmation of an order for a quantity of cotton union suits which he had bought well under the market. A mill representative to whom he made the disclosure warned him that he had bought considerably more than his trade calls for. "I can sell a jobber a part of the lot at a profit to me of $1.50 a case, but I won't," he said.

This is the kind of speculation that mills should discourage and prevent, if possible, for the one important reason that the merchant who overbuys in the present uncertainty is taking grave chances. It is pretty well understood that few merchants are selling as many dozens as they did two years ago, although their volume of business measured in dollars shows a very large increase. But the time comes when they find themselves overstocked with high-priced merchandise and their customers buying less. It is noteworthy that a number of small retailers when pressed for settlement of past due accounts come back with the story that their business is dull and collections slow.

Slow collections ought not to be accepted as an excuse from any retailer for permitting his account to become past due. Wage earners as a class are drawing sufficient to enable them to pay as they buy. Furthermore, they shift

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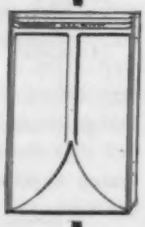

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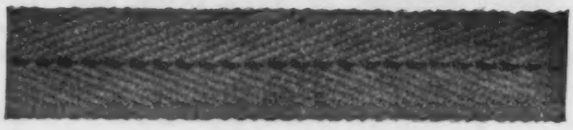

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from one place to another in search of still higher pay, many of them being liable to overlook their accounts with their stores.

The careful retail merchant should be having larger net returns than in the past. Admitting that he is selling fewer dozens, he requires fewer sales persons. Then, too, he is relieved to a very great extent of the delivery charges, his customers carrying their purchases instead of having them sent to their door. In the opinion of careful credit men the merchant who complains of slow collections or dullness in business should be granted no extension, except in very rare circumstances.

But for the taking of more men out of industry for military service under the next draft there might be enough underwear to fill the prospective gap between production and consumption. The government, it is known, bought heavily for a large army and for reserve stocks, on the basis of estimated requirements per man. Since then, it is shown, the salvage department of the army has demonstrated that vast quantities of knitted apparel can be reclaimed, so that it would appear the original estimates of government needs made before salvage was taken into consideration, were above the deliveries that will be required.

But there will be more government buying, for it is estimated that 2,398,000 men will be called in the next draft. These will be taken out of productive channels and become consumers to a greater extent than in the past. Then there is the probability of mill help being shifted to the shipbuilding, munitions and other absolutely essential industries. The deduction must be that any curtailment on the part of the buying public will be more than offset by the further scarcity of help and more acute shortage of merchandise, so that mills with stocks of government seconds and those nursing the fancied grievance that they have been overlooked in the placing of orders abroad, would do better if they were to set about planning for meeting emergencies to come.

But some of the manufacturers have other grievances. Not a few recently received from their banks form letters advising them that beginning November 15 they will be required to pay six per cent on loans which were effected for enabling them to buy Liberty bonds of the second issue. One bank writes that the government desires that these obligations be liquidated. "Here I am confronted with a higher interest rate on the eve of preparing to buy bonds of the fourth issue," said one mill executive, and we must increase wages and dare not advance our prices lest we be accused of profiteering. Really, I am afraid to meet manufacturers in conference to discuss mill conditions, for it will be suspected that we simply met to plan for more profit," he concluded, with the observation that the men who produce are between the devil and the deep blue sea, and gradually being crowded into the sea.

Since a government department has fixed the prices of cotton yarns on the basis of 61 cents for standard carded hosiery yarns, some knitting manufacturers say they no longer look upon profiteering as so flagrant an offense as formerly. It is the sentiment that provision has been made for larger profits for spinners than they hitherto enjoyed. Resentment at what these manufacturers regard unwarranted regulation is not mellowed by the intimation that price-fixing for knit goods is contemplated.

Complaint has been heard that some types of knitted articles, cotton union suits in particular, were selling to distributors at exorbitant prices. There is, therefore, a lurking fear that if the government price-fixing committee takes up the matter some material reductions will be ordered. It may or not be significant that in the last few weeks prices of one or two classes of unions have taken a drop. This, however, may be ascribed to sluggishness in the market rather than to fear of government intervention, and to the fact that here and there a mill had accumulated stock which it was desirable to unload pending the uncertainty involved in the regulation of yarns.

Now that cotton yarns have been officially priced there will be no likelihood of especially attractive bargains in union suits, or shirts and drawers or hosiery, for that matter. It is believed that so soon as the trade masters the new yarn situation there will be more eagerness to operate.

The selling for Spring probably will be on in earnest by mid-September, but most mills will require that the merchandise be taken in before January 1. This may work a hardship to jobbers, but unless they are able to provide for car lot shipment the goods hardly will reach them until well after that date. As the trend is to sell 10 or 30 days net, f. o. b. mill station, the jobber in many cases will have paid for the merchandise before its delivery.

In anticipation of controversies over delays in delivery and non-delivery for a variety of reasons, many manufacturers are protecting thmesleves, so far as possible, by safety provisions affixed to order confirmations. An important commission house is using the following form:

> This order is given by the purchaser and accepted by the seller with the understanding that deliveries may be delayed and the quantities reduced in whole or in part by the seller in case the seller is obliged to delay deliveries and reduce the quantity of the order by reason of war or shipping conditions or governmental acts or any other cause which in the judgment of the seller justifies delays or reductions.

Although cotton stockings have been sharing the market dullness, there is no little inquiry as to prices for both immediate and future delivery. It may be assumed that as underwear is to be bought for the emergency fleet stockings will be wanted. Recent applicants for government orders were told that nothing more was being bought at the time for the army. Since then the orders upon which several mills were working have been increased.

A large eastern mill is selling hosiery, without saying a word about spring, and it is the understanding that the buyers are providing for next year's wants. There is some buying for spot delivery, to fill in, as dealers say, while waiting for shipments delayed by embargoes. Then too there is inquiry for hosiery for shipment abroad. An export house has been huckstering an order for 15,000 dozens, unable to find a mill willing to consider it at the prices the exporter was willing to pay. Buyers generally who have sought to get merchandise on their own terms in a quiet market have been amazed at the firmness with which mills and agents are holding, and some have given up for the present. Cooper, Coates & Casey, have had quite a corps of buyers here for some weeks. All but the resident buyer have returned to Los Angeles. These representatives of the big jobbing house hardly will return until the middle of September, when, by common consent, lines for Spring will be more freely offered.

Among the Knitting Mills.

The Hermitage Knitting Mills Co. at Nashville, Tenn., was recently re-organized and become incorporated with a capital stock of $55,000. They are putting in additional machinery and when completed they will have 42 knitters in addition to other machinery. The product of the plant is also dyed and finished in the same plant. This product is men's 220 needle half hose.

The Stitchbound plant at Hagerstown, Md., will be a branch of the Stitchbound Hosiery Mills, Reading, Pa. It will be equipped with 136 new knitting machines, which have been ordered, for a daily capacity of 5000 pairs of heavy wool and silk half-hose. Space in a building has been secured and the product will be purchased by the Government. H. E. Stamm will be manager at Hagerstown.

An expenditure of $15,000 will be made for the mill machinery of the Liberty Hosiery Mills, Athens, Tenn. The equipment will include 48 knitters, 12 ribbers, 8 loopers and 25 horse-power steam plant with belt drive, for a daily production of 250 dozen pairs of men's half hose. It will be installed in a brick and concrete 120 x 40-foot building which has been completed.

Children's ribbed cotton hosiery, 2500 dozen pairs daily, is the product of the Bell Hosiery Mills Nos. 1 and 2, Suffolk, Va. This company has purchased the Suffolk Hosiery Mills, and that constitutes its No. 2 plant, including a 350 x 125-foot site, 350 x 40-foot knitting-room, 120 x 40-foot finishing room, 80 x 40-foot dye-house and 100 x 60-foot office and storage-room. The No. 2 plant machinery includes 110 ribbers, 140 footers, 30 loopers, electric-power equipment, etc.

The Hickory (N. C.) Hosiery Mills are completing an addition to its plant which will allow for 100 knitting machines. The building is of brick, standard mill construction and finished inside in pure white.

It is reported that D. C. Breeden of Memphis, Tenn., is to establish a mill to spin cotton hosiery yarn and to knit hosiery in that city.

The Mooresville (N. C.) Cotton Mill No. 1 has installed 20 Scott & Williams knitting machines for making men's half hose. They have also recently installed a dyeing and finishing plant for this product.

The charter of the Bowling-Emory Knitting Company at Durham, N. C., has been amended and the capital increased from $50,000 to $250,000 and the name of the company changed to the Tar Heel Hosiery Co.

A new underwear organization is planned for Williamson, S. C. A company has been organized by H. V. Love of Greenville, S. C., and it is planned to begin operation about October 1. The enterprise has capitalized at $25,000 and will be devoted to the manufacture of men's, women's and children's underwear.

The Midway Hosiery Mills have been incorporated at Lincolnton, N. C., with a capital stock of $40,000, by O. F. Lockey, J. E. Carpenter and others.

The Durham (N. C.) Hosiery Mills have recently purchased other real estate on Renfroe St. in Durham on which it is reported they anticipate the erection of another mill building.

The Stroudsburg Knitting Mills Company, Stroudsburg, Pa., is planning for the installation of eight new looms at its plant, to facilitate the handling of a large contract received from the Government for olive drab tape material to be used as trimming for army and navy uniforms. It is planned to have a total production of about 500,000 yards of material weekly.

The World's Star Knitting Company, Bay City, Mich., has awarded a contract to the Austin Company, Cleveland, O., for the construction of the initial unit of the proposed new buildings at its plant, to provide for increased capacity. When completed, the works will occupy the entire two blocks between Water and Washington and First and Second Streets. It is anticipated that this new building at the plant will be completed early in September. The Government is using a portion of the company's output.

The William Brown Company, Inc., Kensington Avenue and Ontario Street, Philadelphia, Pa., manufacturer of hosiery and knit goods, has recently acquired the three-story factory building at Ontario and J Streets, about 97 x 200 feet. It is said the company is planning to use the works for increased operations.

The Columbia Textile Company, a Massachusetts corporation, has filed notice of authorization to operate in New York with a capital of $150,000. H. M. Byrne, 55 Worth Street, has been appointed local representative.

Owen Osborne, Fourth and Somerset Streets, Philadelphia, Pa., manufacturere of hosiery, is planning for immediate work on the construction of a new addition to his plant, to provide for increased capacity. Plans for the structure have been prepared.

The Utica Knitting Company, Utica, N. Y., has recently filed notice of an increase in its capitalization from $2,500,000 to $3,500,000, to provide for business extensions.

Samuel Peters, of New Cumberland, Pa., manager of the Steam Dye & Bleach Works, is said to be considering plans for the establishment of a new mill at Lemoyen, Pa., for the manufacture of infants hosiery.

The Patterson Knitting Company, Patterson, N. J., has filed articles of incorporation with a capital of $25,000 to engage in the manufacture of hosiery and other knit goods. Jacob Nurick, F. Scheffier, and Louis Nurick, Patterson, are the incorporators.

The plant and property of the Standard Knitting Mills Company, located at Grandview Avenue and Ralph Street, Brooklyn, N. Y., has been offered for sale. The works comprise three large manufacturing buildings with power house for operation, and cover a total floor area of approximately 71,000 square feet.

The Orinoka Mills, Ruth and Somerset Streets, Philadelphia, have filed plans and awarded contract for the erection of the proposed new one-story brick and re-inforced concrete factory addition to their plant. The structure is estimated to cost approximately $22,000.

The A. J. Gordon Company, Kensington and Huntingdon Streets, Philadelphia, Pa., manufacturer of textile fabrics, has recently acquired property at 1807-27 East Huntingdon Street, to be used, it is said, for increased operations. The property was assessed at $40,000.

The Arctic Knitting Mills Company, Queens, N. Y., has been incorporated with a capital of $75,000 to operate a plant for the manufacture of knit goods. M. Kruse, J. O.

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EXTRACTORS

Miller, and C. W. Philipthar, 148 Hewes Street, Brooklyn, are the incorporators.

The S. & Z. Hosiery Company, Philadelphia, Pa., has completed the installation of the necessary equipment in a new plant at 1027 Ridge Avenue, and it is planned to inaugurate operations by about September 1. The works will specialize in the production of women's mercerized hosiery.

Harry J. Bush, Reading, Pa., has recently purchased the hosiery manufacturing plant of Weber & Company, Twelfth and Muhlenberg Streets, including machinery, for a consideration of approximately $33,000. The Weber Company was recently placed in the hands of a receiver. It is said that the new owner is planning for the early operation of the plant.

The Bath Knitting Company, Utica, N. Y., manufacturer of knit specialties, has filed notice of an increase in its capitalization from $100,000 to $200,000, to provide for expansion.

The Casino Knitting Mills, Brooklyn, N. Y., has been incorporated with a capital of $10,000, to operate a plant for the manufacture of knit goods. E. H. Rockov, M. Wofsy, and S. Gold, 205 Varet Street, Brooklyn, are the incorporators.

Fire, on July 31, damaged the third floor of the building at 1016 Hamilton Street, Philadelphia, Pa., occupied by the Queen Knitting Mills, Inc.

Every knitter will be interested in S. G. Whitehead's new serial article entitled "Going After Latin American Trade." It begins in October COTTON.

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